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All communications to be addressed:
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S. R. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, &c.

Congress.—September 12th-14th, at the Way Hall, Franklin Street. Opening address at 8 p.m. on September 12th.

Murray Lands (East), at Paruna, Tuesday, September 27th. (Mr. F. E. Sumner, Secretary.)

Eyre Peninsula (Eastern), at Kimba, Monday, October 3rd. (Secretary, Mr. M. J. H. Martin.)

Eyre Peninsula (Central), at Wudinna, Wednesday, October 5th. (Secretary, Mr. Duncan Duguid.)

Eyre Peninsula (Southern), at Cummins, Friday, October 7th. (Secretary, Mr. H. M. Roberts.)

The opening session of each Conference will take place at 10.30 a.m. Papers, questions, &c., for Conferences should be forwarded to the General Secretary, Agricultural Bureau, about a fortnight before the dates mentioned above.

Congress.

The Forty-third Congress of the Agricultural Bureau will be opened by His Excellency the Governor at 8 p.m. on Monday, September 12. Addresses will be delivered the same evening by the Minister of Agriculture (Hon. S. R. Whitford) and the Chairman of the Advisory Board of Agriculture (Mr. H. N. Wicks). A Dairying Session will be held on Tuesday morning, when a veterinary lecture will be given by a Veterinary Officer of the Stock and Brands Department. This lecture will deal with mammitis, contagious abortion in cattle, and milk fever. Two more items will also be included in this session, one of which will be a paper by Mr. E. W. Mattner, of Balhannah. Simultaneously with the Dairying Session, a Fruit Session will be held in another room, when Dr. J. Davidson (Waite Research Institute) will address the meeting on "Some Economic Insect Problems of Orchard Fruits in South Australia"; a paper on "Bees: their Life History and Habits," will be read by Mr. R. Nosworthy (Balhannah); and a further paper on an horticultural subject is being arranged. On Tuesday afternoon papers will be read by Mr. A. G. Barrett on "Ideal Types of Barley for Malting Purposes"; Mr. A. L. McEwin (Advisory Board of Agriculture), "Methods of Improving Draught Stock Breeding"; and Mr. R. C. Scott, "Wheat Varieties in South Australia." In the evening at 7.45 Professor Perkins (Director of Agriculture) will give an address on "Some Points in the Handling of a Fat Lamb Flock on a Mallee Farm." The whole of Wednesday morning will be devoted to Free Parliament, when a large number of motions will be submitted to Congress. The Congress will conclude on the Wednesday evening with addresses by Mr. H. B. Barlow (Chief Dairy Instructor) and C. F. Anderson (Poultry Expert).

There will be the usual visit to the Waite Institute on Thursday morning after the Congress.

A large number of papers have been sent in for the Women's Sessions. These include "The Kitchen," to be read by a member of the Penola Branch; "Poultry Raising," Miss A. L. McKay (Penola); "Useful Knowledge," Mrs. W. J. White (Parrakie); "Hints on Making Cake Batter," Mrs. H. Altschwager (Millicent); "Bread Making on the Farm," Mrs. F. Chilman (Warramboo); "Socks and Stockings" (with demonstration), Mrs. E. L. Orchard (Belalie); "Buying a Cow," Mrs. E. M. Paddick (Kangarilla); "The Uses of Kerosene in the Home," Mrs. E. P. Wall (Eurelia); "Children," Mrs. Rita Haines (Nelshaby); and "First Aid," Miss A. M. Lawrie (Nelshaby).

Prosperity Returns

Royal Spring Show, 1932

September 10 to 17

(7 DAYS AND 7 NIGHTS)

SOUTH AUSTRALIA'S GALA WEEK

Visit the Show and Strengthen Your Faith in the Resources of Your Own State.

Grand Display

Cattle, Sheep, Wool, Fat Stock, Horses-in-Action, Trotting Events, Swine, Poultry, Pigeons, Cage Birds, Dogs, Cats, Rabbits, Dairy Produce and Appliances, Agricultural Produce and Machinery, Fruit, Flowers, Vegetables, Fruit Packing Competitions, Public School Children's Competitions, Needlework, Knitting, Millinery, Dressmaking, Arts, Crafts, and Cookery.

Record Entries — Record Attractions

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Ladies tickets are transferable and can be used by boys under the age of 14 years.

23, Waymouth Street,
Adelaide.

HAROLD J. FINNIS,
Secretary.

Following the usual practice, arrangements are expected to be made for special addresses and visits to places of interest.

All delegates of Women's and Men's Branches are requested to be present on the opening night, and to take their seats by 7.45 p.m.

Besides delegates, other members who are in town during the week are invited to attend any of the sessions.

Export of Butter.

Exports of butter from the Commonwealth for July, 1932, totalled 4,542 tons. Following is a comparison of shipments from the various States during July:—

	July, 1932.		
	United Kingdom. Boxes.	Other Countries. Boxes.	Total. Boxes.
New South Wales	9,377	4,710	**14,087**
Victoria	63,701	8,941	**72,642**
Queensland	77,902	3,722	81,624
South Australia	13,294	36	13,330
Tasmania	24	—	**24**
	164,298	**17,409**	**181,707**
	(4,107 tons)	**(435 tons)**	**(4,542 tons)**

Considering the unsettled conditions of overseas markets and the consequent intense competition, the Minister of Commerce (Mr. C. A. S. Hawker) said recently that he was pleased to observe continued improvement in our export figures, which really expressed increasing appreciation of the excellence of our products. In the present crisis the very real value to Australia of her primary industries, Mr. Hawker added, could not be too strongly urged, and he was confident that the progress achieved with dairying, as with other exports, would stimulate efforts to strengthen our position abroad still further.

Export of Eggs.

In a recent report the Minister for Commerce stated that his department had prepared a careful estimate of the probable quantity of Australian eggs which would be exported to the United Kingdom in the forthcoming season. On present indications, it is considered that between 14 and 15 million dozens will be shipped—an increase of 50 per cent. over the figures for last year. The accompanying table of exports during the last five years is a very significant index of the growth of the poultry industry in the Commonwealth:—

	Dozen.
1927	1,104,005
1928	2,916,338
1929	3,552,580
1930	5,895,090
1931	9,740,790

In addition to the quantity of eggs exported in 1931, a new development of the industry was the export of egg pulp. The quantity exported represented an additional 1,300,000 dozen eggs. A large quantity is expected to be exported this year. An idea of the extent of the market for eggs in Great Britain may be gained from the fact that in 1931 the consumption of eggs in Great Britain amounted to 549,000,000 dozen. Australia's contribution of 18 eggs in every 1,000 consumed was, therefore, less than 2 per cent. of total consumption. The per capita consumption per annum in the United Kingdom is estimated at 140 eggs.

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Preservation of Oranges.

The Citrus Preservation Committee of the Council for Scientific and Industrial Research has recently reviewed the investigations which it has been conducting for the last four years into the best methods of handling oranges intended for storage for any great length of time. An account will be published of the committee's activities, and this account will include the conclusion which the committee has come to in regard to the various processes investigated. It is of particular interest to know that the committee do not recommend the spraying of the fruit with paraffin. A process of washing in sodium bicarbonate or borax and subsequently spraying with paraffin was one of the treatments to which the committee paid particular attention, as it has been claimed that this process, by reducing mould incidence, reduces wastage considerably.

The oranges supplied to the committee for experimental purposes were representative only of the irrigated areas of Victoria, and were sent to Melbourne loosely packed in cases. Under these conditions only a slight wastage occurred through the blue and green moulds, even in the fruit which was untreated. Evidence of the effects of treatment on wastage due to these moulds was thus inconclusive. The process was not found to lengthen the actual storage life of the fruit in any other way. It had a certain amount of beneficial effect in that it considerably improved the appearance of the fruit. All dirt was, of course, removed, resulting in the whole of it having a clean, bright appearance. In regard to the paraffin itself, a light spray can be applied without deleterious effect, but a heavy spray was found sometimes actually to cause a preventive collapse of the fruit. For this reason, there is actual danger in using paraffin with Navel oranges.

Payments of Wheat Bounty.

The Minister for Commerce stated recently that some misunderstanding had apparently arisen amongst wheatgrowers regarding an announcement in connection with payments of wheat bounty. The Wheat Bounty Act, 1931, provided for payment of the bounty of 4½d. per bushel to the grower on all wheat of the 1931-32 season sold or delivered for sale prior to October 31st, 1932. Therefore claims for bounty made by growers in respect of this season's wheat which is sold or delivered for sale before October 31st next would be dealt with by his department, and if growers desired to hold their wheat for the maximum period allowed that was their affair. Bounty would be payable on the wheat provided it was disposed of prior to October 31st, 1932. As the staff of the Wheat Bounty Sections were being reduced, however, it would be in the interests of the farmers themselves to submit their claims at an early date. If not received by the department before August 15th it would not be possible, owing to reduced staffs, to prevent some delay in payment of claims. It was to obviate such delay in the interests of farmers who had delivered wheat, but had delayed submitting claims that a previous statement had been issued giving farmers ample notice of the disbanding or reducing of the special staffs of the Wheat Bounty Section.

Australia's Dairy Produce Exports—Position in United Kingdom Market—Increase in British Imports of Butter and Bacon.

"Australia exported more butter in 1931 than ever before; in that year the value of her butter exports was 54 per cent. above the 1930 level," states the report just issued by the Empire Marketing Board on "Dairy Produce Supplies in 1931" (H.M. Stationery Office, London, 1s. net).

"Supplies of butter from Empire countries increased by no less than 30 per cent. over 1930," the report states. "Empire butter comprised almost 50 per cent. of the total imports as against 45 per cent. in 1930. Never in any previous year have Empire countries accounted for so large a proportion of the United Kingdom butter imp

TONS OF CHEESE.

Australia also had a bumper cheese season. Exports of cheese in 1931 were 2½ times the previous season's total, and the largest since 1925. The United Kingdom took 90 per cent. of Australia's butter and 93 per cent. of her total cheese exports.

Queensland, the principal shipper of butter, has increased her exports to the United Kingdom by more than 300 per cent. since 1926. Butter shipments have risen from 9,400 tons to 30,000 tons. Total shipments from Australia have risen during the same period from 28,000 tons to 66,000 tons.

WORLD'S LARGEST IMPORTER.

Britain now imports more butter (by value) than any other single commodity. In 1931 she paid more for her imported bacon than for her imported wheat. These are two of the facts brought out in the report, which states that the United Kingdom is the world's largest importer of dairy produce. Fully 30 per cent. of her total imports of food, drink, and tobacco are accounted for by dairy produce. Her imports of butter alone were worth £46,358,000 in 1931—nearly double the amount imported before the war.

The total value of Britain's imports of dairy produce of all kinds, including eggs, bacon, poultry, and pork, has risen from £67,262,000 (the average of the three years before the war) to £126,002,000 in 1931, when new records were established for the imports of butter, bacon, poultry, cream, and certain types of preserved milk.

Denmark held her position in 1931 as the chief supplier of butter, and sent Britain 31 per cent. of her total imports. New Zealand came next with 24 per cent., and Australia accounted for 19 per cent. of Britain's total imported supplies. Other Empire countries which increased their exports of butter to the United Kingdom were South Africa and Kenya. Russia increased its supplies by 2½ times, and jumped from eighth to fourth place. The volume of Russian imports, however, was still well below pre-war level.

EATING MORE EGGS.

Over 3,100,000,000 eggs were imported into Britain last year. The volume of Empire supplies was the largest ever recorded, and accounted for 24 per cent. of the total imports. Denmark is the chief source of imports, sending 29 per cent. of the total from all sources. Britain draws her imports of eggs from, altogether, over 30 countries.

The Empire supplies fully 87 per cent. of Britain's total imports of cheese, New Zealand and Canada being the chief sources. A seasonal difference in price between white and colored cheese is a feature of the cheese trade. From February to October colored cheese appeared to be most in demand, but from November to January white cheese became dearer than colored.

AUSTRALIAN FROZEN PORK.

Supplies of bacon to the United Kingdom were, states the report, "on an unprecedented scale" in 1931. Imports rose by 1,950,000cwts. or 21 per cent. compared with 1930, which was in itself a record year. Britain is importing considerably over twice as much bacon as in the years before the war. This figure has arisen from 4,787,000cwts. to 11,138,000cwts., valued in 1931 at £33,136,000. Empire supplies represented only a small part—3 per cent.—of the total imports.

The Empire is, however, supplying most of Britain's frozen pork. "One of the most striking features of the supply position is the increase in shipments from Australia, which were practically negligible before 1930. The quantity imported from Australia in 1931 was nearly four times as great as in 1930." Empire supplies, as a whole, accounted for 59 per cent. of the total imports of frozen pork in 1931. The United States is the chief foreign source of supply.

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POSITION IN GERMANY.

The report also surveys briefly the position of the dairy produce market in Germany, the world's most important market for butter next to the United Kingdom. In 1931, imports of Australian butter into Germany rose to 30,000cwts. from under 400cwts. in 1930. Germany's total imports declined considerably, however, owing to tariff restrictions and diminished purchasing power. Consumption of butter fell by 5 per cent., whereas, in the United Kingdom, it rose by 14 per cent. Germany also ranks second to the United Kingdom as an importer of eggs. Imports of eggs declined by 12 per cent. in 1931.

Poisoning Blowflies.

Replying to a question submitted at the Ceduna Conference as to whether arsenical sheep dips would be strong enough to poison blowflies, Mr. A. H. Robin (Veterinary Officer, Stock and Brands Department) stated that arsenical preparations were most satisfactory for poisoning blowflies, and if sheep were dipped in arsenical sheep dip mixed at ordinary dipping strength, the treatment would not only serve to kill any maggots that may happen to be in the fleece at the time of dipping, but it would further protect the sheep from "fly-strike" for a period of three or four weeks. This was due to the fact that when the dip was being prepared, all of the arsenic was not immediately dissolved in the water, but some of it remained "in suspension," and in the process of dipping was deposited in the fleeces of the sheep in fine, solid particles. There it was gradually dissolved out by moisture in the fleece, thus keeping the wool impregnated with arsenical solution sufficiently strong to poison flies that might light on the sheep and any maggots that hatched out from eggs deposited in the fleece.

The period of protection afforded the sheep could be considerably lengthened by using the arsenical dip mixture in greater concentrations. It was, of course, not safe to immerse the sheep completely in these stronger solutions, and the application of them was therefore restricted to the "breech," which was the part of the animal most susceptible to fly attack. Two methods of application were commonly employed, viz.:—

(1) *Jetting.*—This consisted of the application, around the breech of the sheep, of arsenical dip mixed at a strength of four times that recommended by the manufacturer for ordinary dipping. This solution was applied by means of a special high pressure pump with a very fine nozzle. It was claimed by those who used it that this method of treatment would afford the sheep 90 per cent. to 95 per cent. effective protection up to three months, depending on weather conditions, and it further did away with the necessity for crutching. Owing, however, to the high cost of the special jetting apparatus, the use of this method of treating the sheep was generally confined to large runs.

Swabbing.—Arsenical dip solution mixed double ordinary dipping strength was used, and was applied to the breech area by means of a small rag mop on the end of a stick. The solution might be poured on the sheep and spread with the mop, or the mop might be dipped into a tin containing the preparation and then thoroughly rubbed over the area. This method of treatment was suitable for small farmers' flocks.

Forage Poisoning.

At the Ceduna Conference Mr. A. H. Robin, B.V.Sc., explained the best method of feeding hay that had been badly damaged by mice. It was extremely likely, he said, that as the result of the ravages of the mice the fodder in the stacks would have become musty or mouldy, in parts at least, and that further it might have become impregnated with the deadly *Botulinus* toxin or poison, the ingestion of which gave rise to the very fatal disease of stock, commonly known as "forage poisoning." Horses in particular were very susceptible to this disease. Sheep and cattle were also susceptible, though considerably less so. It would be necessary, therefore, for stockowners, when utilising this damaged fodder, to take certain precautions to safeguard the health of their stock. It should all be carefully inspected and any affected hay with must or mould should be discarded. Those sheaves that appeared to be clean and fit for use should be well shaken to free them from dust, and then opened up so as to expose their contents thoroughly to the air and sunlight for 48 hours prior to feeding. This exposure would serve to oxidise and destroy any possible *Botulinus* toxin on the fodder, to the extent of rendering it reasonably safe to use. With respect to actual methods of feeding it to the stock, any of it that was suitable could, if desired, be fed as hay. On the whole, probably the most suitable way of utilising it would be to chaff it, and either mix it with other sound feed, or, if this was not possible, damp it with molasses and water to improve its feeding value. Because of the lesser susceptibility of cattle and sheep to forage poisoning, it would be preferable to use it up by feeding it as far as possible to those stock rather than to horses.

Purifying Water Polluted by Dead Mice.

For purifying water, polluted by dead mice, the Acting Director of Chemistry recently suggested that the water should be sterilised by stirring into every 100galls. of water 2½ozs. of bleaching powder, and, after a quarter of an hour or longer, stirring in some liquid ammonia, say, half a teaspoonful at a time, until there was no smell of the bleaching powder left. He, however, recommended that before the water in the tank was treated a certain quantity should be taken from the tank and treated in the proportions stated. Should the treatment result in the water being fairly free from offensive smell and taste, he considered it would be safe to use it after it had been boiled, and the balance in the tank must then be treated likewise. If the water did not respond to the treatment, it was considered that it would be contaminated to the extent that it would not be fit for use. He would be pleased to be informed by anyone using this method as to the result of the treatment.

Preserving Super Bags.

In discussing at the Ceduna Conference the method that might be adopted to preserve super bags when emptied, the General Secretary stated that a fertiliser manufacturing company had recommended the use of one teaspoonful of bicarbonate of soda to every 2galls. of water, soak well, and finally rinse the bags in clean water. A delegate said that he had obtained good results by soaking the bags in sea water. Mr. S. Shepherd (Advisory Board of Agriculture) informed the Conference that he had used bags four times and thus saved 5s. 6d. a ton in his purchases of super. His practice was to empty the sheep dip and flood it with water. He then filled the dip with the bags and left them for two or three weeks, and he found that when removed they were in good condition.

Pasture Competitions.

The South Australian Advisory Dairy Board is arranging for pasture competitions in three districts of the State, namely, Central, South-Eastern, and Irrigated Areas. Entries are due not later than Wednesday, August 31st, 1932, and will be restricted to dairymen milking at least seven cows. Prizes consisting of trophies to the value of £3 3s., £2 2s., and £1 1s., together with Certificates, are offered for each district. A fee of 1s. will be charged for each entry.

Entries are to be for pastures of not less than 5 acres for Central and South-Eastern districts, and 3 acres for Irrigated Areas. Competitors will be asked to state clearly in their applications:—(*a*) The location of pastures; (*b*) the area of these pastures.

It is hoped that dairymen will support these competitions, and information will be readily supplied to applicants by the Hon. Secretary, South Australian Advisory Board, office of Minister of Agriculture, Adelaide, to whom entries should be forwarded.

Export of Barley.

The Minister for Commerce (Mr. C. A. S. Hawker) reports that the figures for the export of barley from Australia for the 11 months ended May, 1932, disclosed a considerable increase over the figures for 1931, as follows:—

1931 (11 months) .. .. 1,522,293 centals, valued at £368,120
1932 (11 months) .. .. 1,588,473 centals, valued at £431,404

According to advice received, about 46 per cent. of Great Britain's imports of barley were used in brewing, and somewhat over 50 per cent. for all malting purposes, the principal countries of origin being California 60 per cent., Chili 7 per cent., Czecho-Slovakia 5 per cent. Of the 599,313 tons of barley imported into Great Britain in 1929, Australia's share was about 1½ per cent.

Provided that the production of suitable types of good quality barley was maintained, and the volume expanded, there appeared to be a reasonable prospect that Australia could secure a greater share of the English market. Considerable attention has been paid to the production of barley in South Australia and Tasmania, and further success would no doubt ensue with a closer knowledge of the types in favor on the English market.

Trade with the East.

The latest statistical information published by the Minister for Commerce concerning Australia's trade with the East shows that in the principal commodities, with the exception of frozen meat, there has been an increase when compared with the previous year. This is highly gratifying when it is remembered that 1930-31 was a record year in so far as the volume of trade was concerned. The comparative statement of the principal exports during the first nine months of 1930-31 and 1931-32 shows the following:—

	Nine Months, 1930-31.		Nine Months, 1931-32.	
	Centals.	Value. £	Centals.	Value. £
Butter	79,858	460,908	95,063	502,452
Flour	2,377,105	899,216	3,184,389	1,010,164
Wheat	17,840,305	3,845,893	24,295,341	5,823,688
Wool	1,067,703	4,337,709	1,513,769	6,192,658
Beef	100,829	182,116	65,634	128,728
Mutton and lamb .	16,384	36,280	15,269	29,849

The exports of other commodities of primary production for the first six months of 1931-32 to the East were:—Milk and cream, 51,475 centals, £253,000; canned fruits, 3,417 centals, £6,499; cheese, 1,267 centals, £5,903; sheep, 12,268, £4,012; wine, 1,418galls., £547. The requests for information relating to trade have covered an exceptionally wide range of commodities. Primary products, other than those mentioned above, in regard to which inquiries were made include the following:—Dried and fresh fruits, dairy cattle, flour, fodders, feed oats, hides, and skins.

Standardisation of Export Apple Cases.

The Standards Association of Australia has been asked to carry out work on the standardisation of export fruit cases, and has referred the matter to a special committee, of which Mr. I. H. Boas, Chief of the Division of Forest Products, Council for Scientific and Industrial Research, is chairman. The committee decided to restrict its work in the first instance to apple cases. Evidence is abundant that the use of a number of different types of case causes serious inconvenience in shipping, and consequently adds to the cost. Furthermore, there is a great conflict of opinion as to the relative merits of the local hardwood dump case and the imported softwood standard case in their ability to carry fruit to London in the best possible condition. The committee was faced with this conflict based upon more or less general observations, and asked the Division of Forest Products to carry out a series of experiments to definitely establish the facts. This work was begun in May of this year by the Senior Plant Pathologist of the Division of Plant Industry, and the Utilisation Officer of the Division of Forest Products.

It was found advisable to restrict the work in the present season to the development of a suitable technique. The main idea was to develop tests which would yield results translatable into actual practice. After two months' work, involving the careful packing, testing, and re-examination of over 70 cases of apples, a good basis has now been laid for a far more extensive series of tests in the next season. The extent of the work involved can be seen from the fact that this year the detailed examination of over 7,000 apples was carried out. The details of all bruising were recorded and analysed. Some very important facts were indicated, but it will not be reported until further work on a larger scale confirms them. It is expected that established facts will then replace the present opinions, and definite steps on standardisation will follow.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publications:—

"Intensive Systems of Apple Production." Bulletin 49, Ministry of Agriculture, England. Price, 9d. net.

"Dairy Produce Supplies in 1931." Empire Marketing Board. 1s. net.

Davy's Devon "Herd Book." Vol. LV.

"Zebu (Brahman) Cross Cattle and their Possibilities in North Australia," C.S. and I.R. Pamphlet 27.

"The Pig Industry," C.S. and I.R. Pamphlet 28.

"Entomological Control of St. John's Wort," C.S. and I.R. Pamphlet 29.

"Bionomics and Economic Importance of *Thrips imaginis* Bagnall, C.S. and I.R. Pamphlet 30.

"Changes in the Demand for Butter," E.M.B. 48. Price 1s.

"Fruit Supplies in 1931," E.M.B. 49. Price 1s.

"Demand for Honey," E.M.B. 50. Price 1s.

"Milk Price Margins," E.M.B. 51. Price 1s.

"Dairy Produce Supplies, 1931," E.M.B. 52. Price 1s.

"Empire Marketing Board, 1931-32," E.M.B. 53. Price 1s.

"Vegetable or Seeds and Oils," E.M.B. 54. Price 1s.

"Canned and Dried Fruit Supplies," E.M.B. 55. Price 1s.

"Poultry Research in the United Kingdom, 1932." E.M.B.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

Agricultural Bureau, Hindmarsh Island, reports—(1) Cow just calved but no milk supply, and (2) ewes with sore lips.

Replies—(1) Failure to secrete milk may be due to atrophy and wasting of the substance of the udder as the result of former disease of the gland, or it may be merely a temporary functional disorder of the milk secreting cells. If the udder seems healthy and [illegible] faulty apparently in size and activity, it should be massaged two or three [illegible] with a little olive oil, and "stripping" of the teats should also be practised. A [illegible]ative medicine can be given, and the animal's diet changed to sloppy, nourish[illegible] Warm milk may also be given to drink if the animal will take it. One (1) tea[illegible]ul of powdered nux vomica should also be given on back of tongue 3 times daily fo[illegible] few days. (2) The trouble is probably a necrotic stomatitis. Change the ewes on to fresh pasture. Scrape or soak off all scabs, and after drying gently smear lightly with 5 per cent. carbolised vaseline ointment. If the sores extend to the inside of the lips and on the gums, bathe these gently with weak Condy's solution and then daub with weak tinct. iodine (tinct. iodine, 1 part; water, 2 parts). Two or [illegible]ee daily dressings should be all that is necessary to effect a cure.

Agricultural Bureau, Wasleys, reports cow showing shortage of milk. Milk from teats is curdled.

Reply—The condition is Mammitis. The following treatment is advised:—(1) Isolate cow. After treatment disinfect hands before milking other cows. (2) Apply hot packs 3 to 4 times daily to affected quarters. (3) Subsequently dry and massage gently with warm camphorated oil. (4) Strip out affected quarters 6 to 7 times daily. Affected milk should not be stripped on to floors or yards. Owing to the nature of this disease, vaccination is not as satisfactory either as a curative or a preventive for mammitis as it is for some other disease. The Commonwealth Serum Laboratories have a mixed mammitis vaccine which could be tried, either to prevent the disease or to treat cases of mammitis. The price per cow (to prevent disease) is 3s. 6d. Should you consider trying the vaccine on your herd I would advise you to pay a personal visit to this office and discuss the matter.

Weavers Agricultural Bureau reports—(1) Cow with badly cut teat partly healed, but milk is leaking; (2) heifer with very large navel.

Replies—(1) Nothing can be done until the cow is dried off. It will then be necessary to scarify the edges of the wound with a clean sharp knife so as to leave a fresh healing surface. If possible a deep stitch of silk soaked in iodine should then be inserted to bring the edges close together. This stitch should be removed in seven days' time. (2) If the swelling in the region of the navel has not decreased in size by the time the calf is 10 to 12 months' old, it should be sold for slaughter.

Clanfield Agricultural Bureau asks for dressing to reduce swellings caused by bruised shoulders on horses.

Reply—The bruising under such conditions is due to horse being "out of condition." Such cases should be put out of work or else a breast collar used. The following dressing is suggested:—Lead acetate, 1oz.; zinc sulphate, 6 drams; water, 1 pint. Apply lotion 3 or 4 times daily.

Warramboo Agricultural Bureau reports mare with foal—mare's udder is very sore, hard, and swollen.

Reply—It is possible that the mare has a chronic mammitis (inflammation of the udder). Do not allow the foal to suckle. Apply hot fomentations 2 or 3 times daily for a few days. If any abscess formation takes place lance swelling with a clean, sharp knife and syringe out with lysol solution. If condition does not clear up, it is not advisable to breed from mare, because udder cannot then function properly.

Brentwood Agricultural Bureau asks—(1) Are horses more subject to forage poisoning than cattle or sheep; (2) is danger lessened by exposing fodder to air; (3) what is the cause of the poisoning; (4) horse very sluggish, heavy cough, and labored breathing; (5) mare with severe constipation.

Replies—(1) Horses are much more susceptible than cattle or sheep, though the latter can also contract this disease. (2) If the affected fodder is well opened up and exposed to air and sunlight for 48 hours prior to feeding, this exposure will help to oxidise and destroy any poison on the feed, and render it reasonably safe for use. (3) Contamination by the toxin or poison produced by the *Bacillus botulinus* when growing actively on the fodder. (4) The animal is apparently broken winded. Treatment for this trouble can only be palliative. So far as possible, bulky feeding should be avoided, the feeds being made nutritious and concentrated. The feed should be given lightly damped to prevent any dust in it causing irritation to the throat with resultant coughing. The animal should further never be put to work within an hour or so after feeding. An occasional drench of raw linseed oil, 1½ pints; turps, 4 tablespoonsful; can be given to maintain the bowels in good order, and one tablespoonful of Fowler's solution of arsenic can with advantage also be given in the feed night and morning for a fortnight. (5) In cases of bowel stoppage, the purgative drenches and enemas should be supported by giving night and morning 1 level teaspoonful of powdered nux vomica. This is best given by mixing the dose in a spoonful of honey or treacle to make a paste, which can be smeared on the animal's back and tongue.

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Agricultural Bureau, Myponga, asks what signs indicate a sow being on heat.

Reply—The usual signs are that the sow exhibits restlessness and utters peculiar cries or grunts. The sexual organs become enlarged and the vulva protrudes and is inflamed and swollen. In many cases she attracts attention by repeatedly jumping on the backs of other sows.

"Spalding" reports death of horse. Symptoms:—Fed on good feed; in great pain, passing water frequently whilst being dosed, struggled and died very suddenly.

Reply—The horse apparently died from a severe attack of flatulent colic. Care is necessary in putting horses and all stock on to such young green feed. Horses frequently get serious forms of colic, and laminitis is also common. The treatment suggested for a draught horse is:—(1) Give this drench at once: Raw linseed oil, 1½ pints; oil of turpentine, 2ozs.; household cloudy ammonia, ½oz. (2) Give enemas of warm, soapy water (3 to 4 gallons) every 3 or 4 hours if necessary.

Agricultural Bureau, Elbow Hill, asks cure for blood worms in horses.

Reply—(1) Starve horse for 24 hours. (2) At end of that time give the following drench:—Raw linseed oil, 1½ pints; oil of turpentine, 4 tablespoonsful. (3) Subsequently give one tablespoonful of Fowler's solution of arsenic in a small damped feed night and morning for 14 days (buy a 1lb. bottle of the solution). (4) Feed regularly on good quality chaff, bran, and crushed oats. Good management and good regular feeding by keeping the horses in good condition lessens greatly the effects of worm invasion.

Ceduna Conference: What is the best ration to prepare a draught stallion for the breeding season?

Reply—It is not possible to set out any specific best ration for this purpose as so much depends on the individuality of the animal, whether it is an easy animal to get into condition, or whether it is a hard one. There is no necessity to use any special nostrums in the way of feeding, such as eggs, condiments, &c., the job can be done quite satisfactorily with the ordinary farm foods. As a basis to start operations I would suggest that the animal be fed four times daily at regular intervals, each feed to consist of ¾-1 kerosene tinful of chaff, 1lb. bran, ¾lb. crushed oats. In addition, a moderate allowance of green feed can be given daily and ½lb. boiled whole linseed twice weekly. A lump of rock salt should be kept in the manger, and, of course, water supplied, *ad lib*, to drink. As one goes along it may be found necessary to vary this ration somewhat—a little more or less feed may be required, or the grain allowance may have to be increased or decreased, &c. But these are all matters of detail that have just got to be left to the judgment of the owner. The aim must be to get the animal into good flesh and not have him hog fat and soft. His feeding must therefore be worked out in conjunction with the provision of plenty of regular exercise that will make for that necessary "hardness," and for this purpose there is nothing better than to put him to some regular, honest work about the farm. Failing this, he ought to be given at least four or five miles of steady road work daily.

FEDERATION WHEAT AND RUST.

A correspondent at Cowell has been advised by the Supervisor of Experimental Work (Mr. R. C. Scott) that Federation wheat is very susceptible to red rust, but the severity of the disease depends entirely upon the character of the weather in spring or early summer. Varieties which mature early frequently escape, because they have reached a sufficient stage of maturity before rust-favorable weather is experienced. Therefore, if Federation is sown early in the season it has a greater chance of escaping than if sown late. At the same time, should humid climatic conditions obtain before the grain has become firm, Federation may be badly attacked by red rust, notwithstanding early planting.

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VARIETAL PURITY AND STABILITY IN WHEAT, OATS, AND BARLEY.*

[By Allan R. Callaghan, D.Phil., B.Sc. (Oxon), B.Sc. Agr. (Syd.).
(Principal, Roseworthy Agricultural College.).]

INTRODUCTION.

Few questions are of greater agronomic interest, or present such fundamental and intricate problems as those concerned with the conception of a variety as an agricultural unit. To the majority of those dealing with varieties of farm crops in the course of every day life, the variety is a simple and understandable item in their industry; it will probably surprise them, therefore, to know that concealed in each variety are some of the most subtle and evasive of the scientist's problems.

Occasionally impurities are noted in varieties far in excess of the average, their very presence leads to alarm which more often than not spreads beyond the bounds of the farm concerned; inexplicable theories are usually advanced by way of explanation, and by inaccurate interpretations of its behavior the variety is very often seriously libelled. It is in reality a case of misrepresentation leading to misinterpretation. Indeed, the nature of the variety as such is pathetically misunderstood; it is blamed for "reversion," "running back to the wild form," "splitting up," "running out," and in fact "not being what it used to be." Another expression, "reversion to type," is equally baffling; a term which, on analysis, from the point of view of the variety, adds insult to injury. With full and appreciative respect for the work performed by practical agriculturists, the plant breeder is unable to accept such expressions. Whilst they probably possess the virtue of being impressive, as an explanation, they are meaningless, and obviously vague.

The plant breeder is concerned with the evolution of new varieties, and also with the maintenance of the structure of already existing sorts. He is also interested in the preliminary trial and behaviour of all varieties under field conditions, for without this intimate contact the practical utility of his work would diminish in direct proportion to his lack of interest; besides this the faith and hope in his task, which are his chief inspirations, would be gradually lost. New varieties leave his hands to face the crucial test of field trials and commercial farming, consequently he is interested in their subsequent behaviour and all criticism or commendation pertaining thereto.

Seldom are farmers fully acquainted with the process of fixing a new variety, and whilst the agronomic worth of any variety may be, and is eventually in all cases, correctly interpreted by them, the variety as such is often misunderstood. The question of varietal behaviour is so constantly with all agriculturists, from the plant breeder, through the field officer to the farmer, that its general elucidation as far as that is possible should be welcome. This involves an understanding of a few of the basic principles of breeding, and an attempt is made herein to express lucidly, if briefly, those which govern varietal purity and stability. The objects of this article are therefore threefold, (1) to portray as clearly as possible the intricacies concerned in the problem of seed-purity and varietal stability, (2) to define the principles which form the foundation of the pure-seed production of any variety, and (3) to correct some misconceptions and misinterpretations of certain irregularities which are often alleged to be features of established varieties.

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*Numerous articles bearing upon this subject have appeared in the various agricultural and scientific journals of the world. This article is written for a general purpose and in a general manner, consequently no explicit references to literature have been cited. Most text books on Genetics deal in detail with the scientific principles involved herein.

THE APPLICATION OF THE PURE-LINE THEORY.

Many old ideas still retained with regard to varietal phenomena are based on the foundational works of Charles Darwin. If one were to read the "Origin of Species" and neglect the discoveries and developments made since then, it would be possible to formulate many of the ideas which unfortunately are still in currency. It is amazing the number who still believe that constant selection within a self-fertilised variety will continuously transform the variety in favor of the lines of selection. Many arguments might be raised in favor of such opinions, based mainly on the success of early selectionists, but none remains valid in the light of the pure-line theory advanced by Johannsen in 1903 and confirmed by the genetical knowledge which has accumulated in the last 20 years.

This theory has a Mendelian explanation, and it is based on the fact that if an individual plant of a self-fertilised line is homogeneous for the factors determining all its characters, then its offspring will breed true in all details; further, selection within such a pure-line cannot possibly modify any particular character or characters in the subsequent progeny. It has, however, certain limitations in general practice for it pre-supposes absolute self-fertilisation in the first place, and in the second place, homozygosity (absolute purity) of all characters. It asserts that having once obtained homozygosity of any variety, that is a pure-line, and provided self-fertilisation continues in future generations, such a variety will, in the normal course of events, remain pure, and selection within it is absolutely without effect. In other words, it would remain identically the same from one generation to another; it would be neither capable of degeneration nor improvement.

From this then the queries arise: Are our varieties pure-lines in the truest sense of the word? If not, what degree of relative purity do they possess? The heritable characters of the plant are inseparably associated with any answers that might be given to these questions. These characters fall into two major categories —(*a*) morphological characters, most of which are definite and readily defined; and (*b*) physiological characters, most of which are masked from observation, and difficult of definition.

On the basis of our present knowledge it is considered that all characters are inherited according to Mendelian principles, that is, each character has a factor or set of factors determining its expression which is independently inherited. The more obvious morphological characters of wheat, such as color of grain, color of glumes (chaff), degree of beardedness, and so on, are easily traced, and their inheritance can be followed. It is more difficult to follow morphological characters of a qualitative nature, such as strength of straw, shedding characteristics, or flour strength, because the character itself evades exact description and is affected by local environment. It is even more difficult, and in some cases impossible, to trace the hereditary traits of most physiological characters for the reason that they are hidden and only find expression in the general life and prolificacy of the plant.

It will be seen, therefore, that although a variety may be produced true to a certain morphological description there is no proof that it is also true for the invisible and more abstruse physiological characters. It is, however, permissible to assume that a variety breeding true for its outward and visible characters will also, as a general rule, according to Mendelian principles, react with very reasonable consistency from the physiological viewpoint, that is, in vigor, disease reaction, and yielding capacity. Having fixed a group of factors, the characters which these factors determine will breed true, and in the strictest sense of the word, such a variety is a pure-line as far as the particular characters in question are concerned, and it will breed true for them whilst ever self-fertilisation continues uninterrupted. This, then, must serve as the interpretation of the degree of purity it is legitimate to apply to our own varieties of wheat, oats, and barley. Whilst it is correct to say that they are pure-lines for all characters with which the agriculturalist is concerned, theoretical data limit their acceptance as pure-lines accordingly.

The process of fixing a type will be dealt with subsequently, but before going into the details involved therein, much unnecessary discussion on the relative fixity of types may be avoided by arriving at the true agricultural conception of what may constitute a variety.

THE VARIETY CONCEPT.

The conception of a variety of any crop, and of cereal crops in particular, is a purity concept, and as such, varietal identity in the minds of all agriculturalists from the plant breeder to the farmer should be governed by this conception. It is, however, very often at fault; from the foregoing it is clear that many fallacies arise as the result of the retention of old ideas which have been left unceremoniously behind in the progress of biological learning, other fallacies arise through lack of knowledge of basic principles.

Technically speaking, a variety should be defined as a pure-line, but it is impossible to be certain that all the plants belonging to the one variety are identical in all physiological and morphological factors. The variety as used in agriculture is a unit with which the grower is so vitally concerned that a truer definition should be attained by approaching the matter from the viewpoint of the farmer.

The first thing demanded of a variety is a capacity to yield well; unless it is prolific and capable of yielding as well as, or better than, any other variety under similar conditions of culture, the farmer is not interested. Unconsciously, he thus stresses the importance of physiological characters. This is as it should be, for after all, the true measurement of the general physiology of any variety is its production; conversely the yielding capacity of any variety is the agricultural expression of its physiology. First and foremost, then, a variety must be able to retain its yielding ability under conditions of a given environment which implies the possession of a certain physiological stability, or in other words, it must be fixed for those attributes that combine to make it yield well. It does not necessarily follow that such a variety is fixed for every physiological character, but, as will be shown later, after several generations it may contain different physiological strains, all of which may yield up to the standard required of the variety as a whole, but which may react differently under different environmental conditions or to different diseases.

Unfortunately, only very few physiological factors of a variety find morphological expression, of these the most accessible to study are disease reaction and maturity; consequently it is possible to fix a type, in a comparatively short time, which will be resistant to a certain disease, or form of the disease, and which will mature evenly. Yield, being of paramount importance, is given special attention, and by selecting and retaining these strains (of any crossbred) of high yielding ability, the combination of the most desirable physiological characters is obtained and fixed unconsciously.

It will be seen, therefore, that from the physiological standpoint at least, there is an allowable agricultural interpretation of the word "variety," which in itself implies a certain latitude or departure from the scientific definition of a pure-line. The morphological aspects of the problem invariably receive greater attention and emphasis, because they represent the variety as recorded by the senses. The desire for uniformity in visible characters is based chiefly on the assumption that if a variety is not breeding true for morphological characters it cannot be expected to be true for the important factors governing prolificacy. Consequently, every endeavor is made to obtain cultural races which will breed true to a certain taxonomic description. Even from this aspect of the problem there is an agricultural allowance, for many minute morphological details are overlooked, and varieties may be distributed which if submitted to detailed scrutiny would reveal certain inherent differences. It is a just conclusion, therefore, that although the plants constituting a variety may differ inherently from one another in minute details, they are inherently similar in all the obvious characters which enable them to be distinguished as a group from any other group of plants fixed for a similar set of characters. The agricultural variety, or *race culturale*, therefore, is conceived in the first place as a morphological unit, but its subsequent importance agronomically depends upon its physiological characters which determine its capacity to yield well in comparison with other varieties. Both morphological and physiological aspects demand a certain degree of purity, to carry the demand to absolute purity is unwarranted, and the agricultural conception whilst directed to absolute purity is fulfilled by a standard of relative purity. Provided the plants representing a variety are sufficiently homogeneous to constitute a group which has inherent morphological and physiological characters which make it distinct from any other such group, minor inherent differences between the plants within the variety are permissible.

Having fixed a variety according to this conception it is released for general culture; it is a pure-line as far as its most important characters are concerned, this defines it as a separate type, and no departure from this type is to be expected, and its standard of purity may be expected to remain uniform.

FIXING THE TYPE.

A variety on leaving the plant breeder is spoken of as a "pure-line" according to the concept outlined above; in all visible and measurable characters, and to all intents and purposes it is breeding true. The production of such a pure-breeding line involves a general principle which is best explained by adopting symbols rather than genetical terms. Briefly stated, this principle implies that where continued self-fertilisation (as in wheat, oats, and barley) is allowed to proceed without selection, the resultant plant population, after a few generations, will approach complete homozygosity, or in other words, consist of a number of pure-lines. This principle is governed by the Mendelian laws of inheritance, and the theoretical summary cited below illustrates the operation of the process for one pair of allelomorphic (opposite) factors, assuming that these factors are inherited as simple Mendelian units segregating in the ratio of 1 : 2 : 1.

Take *A* to represent one character (say brown chaff) and *a* to represent the opposite character (in this case white chaff). Assume now that a wheat (*AA*) pure for *A* is crossed with a wheat (*aa*) pure for *a*; the plant or plants so obtained would be heterozygous and represented as *Aa*, that is, they would possess both characters *A* and *a*. The progeny from these plants, according to the laws of inheritance, will segregate or, in other words, combine to produce types *AA*, *Aa*, and *aa* in the ratio of 1 : 2 : 1. In this generation it will be seen the percentage of heterozygous plants (*Aa*) is just 50 per cent. of the total population. Now *AA* and *aa* represent a pure or homozygous condition, and will breed [illegible] accordingly; only the 50 per cent. of *Aa* will continue to segregate. It is evident, therefore, that in each succeeding generation the percentage of *Aa* types will rapidly decrease.* The progeny from the 1 *AA* : 2*Aa* : 1*aa* population will be in the ratio of 3*AA* : 2*Aa* : 3*aa*, and in this the *Aa* plants only represent 25 per cent. Continue the in-breeding, and in the next generation the ratio becomes 7*AA* : 2*Aa* : 7*aa*, in which *Aa* plants only represent 12.5 per cent.; in the following generation it becomes 15*AA* : 2*Aa* : 15*aa*; in the next it becomes 31*AA* : 2*Aa* : 31*aa*; whilst the offspring of the latter would be in the ratio of 63*AA* : 2*Aa* : 63*aa*, in which the *Aa* types form less than 1 per cent. of the total number of plants.

It is apparent that before very long the percentage of *Aa* plants would be so small as to be negligible, and the population would consist almost entirely of *AA* (brown chaff) and *aa* (white chaff) plants. In other words, the population would have reached a state of almost complete homozygosity. It would then be possible to select plants from the population which would breed true for the character in question, that is, either white or brown chaff. As the principle holds good for all characters, however, it is possible to speak more generally, and say that selections could be obtained from such a population which would breed true to the type selected.

In effect the plant breeder is guided by such knowledge, but he hastens fixation (the homozygous condition) by selecting individual plants, which conform to the type he is seeking, from every generation until such time as no noticeable variation exists in the progeny. Until this latter condition is reached it is in his interests that the seed of the whole population should not be bulked, otherwise it would ultimately stabilise itself as a number of pure-lines by means of the process referred to above.

It is very clear, therefore, that the judgment and care of the plant breeder has a deciding influence on the subsequent behaviour of a variety. If his judgment has been at fault or hasty, a variety might be distributed which, in the course of a few generations, would show evidence of different types. The common error, particularly amongst farmers, is to regard this as "a natural law of reversion"; in effect it is nothing more nor less than the natural process of segregation; it is not a process of deterioration, but, as shown above, it merely leads eventually to the production of a population of different lines or varieties. To rectify such trouble selection is then necessary to isolate individual strains which conform to the desired type, test their comparative value, and proceed with the strain which proves most desirable.

At this stage it is expedient to refer to the practice of plant improvement by selection. First and foremost it must be emphasised that such practice is only possible when the variety from which the selections are to be made consists not of a pure-line, but of a mixture of pure-lines. The procedure is simple, for it merely involves selection of individual plants, the growth of their progeny in test rows for comparative purposes, and the subsequqent multiplication

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*The ratios are probably more easy to follow if each plant is assumed to produce a given number of seeds, say 40. Then the F1 plant, which is of constitution *Aa*, will produce 40 plants distributed in the ratio of 1 : 2 : 1, that is, 10 plants of the constitution *AA*, 20 plants of the constitution *Aa*, 10 plants of the constitution *aa*. If each plant produces 40 seeds the following generation the 10 *AA* plants will give 400 *AA* plants, and similarly the 10 *aa* plants will give 400 *aa* plants, but the progeny of the 20 *Aa* plants will continue to segregate, and will produce 800 plants in all, 200 of which will be *AA*, 400 *Aa*, and 200 *aa*. Thus the total of *AA* and of *aa* plants for this generation will each be 600, whilst the total *Aa* plants will be 400. The progeny is, therefore, 600*AA* : 400*Aa* : 600*aa*, which is according to the ratio 2 : 3, the *Aa* plants representing 12½ per cent. The other ratios follow similarly.

of the most promising line for distribution. This conforms with the above explanation, and the object of selection is always to isolate pure-lines; having isolated them their multiplication can be proceeded with without much risk of them proving to be other than fixed for the type selected.

If, however, selections are taken from a variety which is true to type, no success can be expected. In any such variety it is well known that there exists a certain variation between individual plants. These minor variations are known as fluctuating variations. For instance, there are large ears, intermediate-sized ears, and comparatively small ears in every crop. By continuously selecting the large ears from a fixed variety from one generation to another it is not possible to obtain a variety which will yield all large ears, nor is it possible to raise the average size of the ears of a pure variety. Similarly, selecting non-infected plants from a fixed variety susceptible to a particular disease does not help in the production of a disease-resistant type, for the offspring will give the same comparative infection as the parent variety under similar conditions.

STABILITY OF THE VARIETY.

From the preceding paragraphs it is to be inferred that a state of stability exists in all fixed varieties. If it were possible to exclude agencies such as mechanical mixture and mutation, and guarantee complete self-fertilisation, then all varieties could be kept stable indefinitely, and with little trouble, for hereditary constancy could then be explicitly relied upon.

The idea that a long-established variety, which has been fixed and grown for many years, is liable to "break up" or "tend to vary" suddenly, without the intervention of external irregularities has no evidence whatever to support it; indeed, it is essentially erroneous to assume that it still possesses the inherent capacity to vary.

It is equally fallacious to regard such varieties as capable of "reversion," a term that has been used so glibly, loosely, and inaccurately that its true meaning is almost lost. A recapitulation of the foregoing would prove that fixed varieties are incapable of reverting to their original ancestors. There are no known means whereby reversion can occur except as a result of crossing or mutation, and it is a manifestation very clearly explained in the light of genetics. If, for instance, two varieties are crossed, and if their constitutions are such as to ensure a combination of factors which represent the constitution of some original type, then the resultant individual will possess the characters of the original stock, and a genuine case of reversion would be revealed. By way of example, by crossing a white sweet pea of a certain constitution with a white sweet pea of a complementary constitution, the offspring will not be white, but red. In this case factors are brought together which determine the expression of red color which was the original type. The parents, however, show no indication of this original strain, both being true for white, but their progeny proves to be reversionary. It follows that the use of the word "reversion" in connection with varieties in the field is generally erroneous. Variation within an old variety that has bred true to type cannot, therefore, pertain to its hereditary characters, but it can be more definitely ascribed to mechanical mixture or to natural crossing, or to both.

Another common belief is that a variety, especially new creations, are more vigorous when they leave the plant breeder than they are in subsequent generations. This misconception is undoubtedly based upon a vague idea of what breeders refer to as heterosis, or hybrid vigor. Heterosis is a very common thing in the early stages of cross-breds, especially in the first generation, but unfortunately, its effects are merely transitory, and it cannot be fixed. In point of fact, hybrid vigor, as its name might indicate, presupposes a heterozygous condition, so that any family of plants which is not fixed may show hybrid vigor, but when the determining factors of its constitution become homozygous, or pure, all trace of hybrid vigor is lost. In crops such as wheat, oats, and barley, which are self-fertilised, there is no known mechanism whereby use of heterosis can be made; it disappears rapidly after the first generation and is entirely lost by the time the variety is fixed. Consequently the only conclusion to arrive at is that once a self-fertilised variety is breeding true it does not possess any hybrid vigor whatever, even though it might be only one or many generations removed from the plant breeder.

The identity and purity of the already existing varieties is maintained by selection, comparative testing, multiplication, and careful handling of the lines, a duty of the plant breeders. When it leaves the stud rows and reaches the farmer certain agencies come into operation which militate against the maintenance of purity. As the stability of the variety depends upon these agencies, they are succinctly given below.

(1) External agencies leading to mechanical mixture. These are due to several influences, the chief of which arise—(*a*) during pickling or dusting, (*b*) during drilling and seeding operations generally, (*c*) at harvest time, and (*d*) when grading; or from (*e*) self-sown grains, (*f*) grains in horse-droppings, and (*g*) the use of old bags, &c.

(2) Internal or natural agencies such as (*a*) natural crossing between adjacent varieties, or between the variety and any stranger which may have intruded as a result of any of the causes of mixture. Natural crossing, however, is low, but it is feasible to suppose that considerable variation ultimately results from the process in the field. (*b*) Mutation or the spontaneous appearance of "sports," which is very rare and would only account for a very minute part of varietal mixture. (*c*) Other genetical instability which gives rise to forms such as fatuoids in oats, speltoids in wheat, &c.; this, too, is comparatively insignificant compared with other factors.

These agencies are, practically speaking, unavoidable on the average farm; time and expense are the limiting factors; even so, certain general precautions should be taken, such as care in the purchase of pure seed, the cleaning of farm machinery when dealing with grain intended for seed, and so on. It is quite a simple matter for the farmer to keep his variety reasonably pure by a system of bulk selection, that is, by selecting a large number of plants from the crop which conform to the characteristics of the variety, bulking the seed and growing it in multiplication plots. The facilities on the average farm, however, are not very adequate, and usually the process of keeping varieties pure indefinitely becomes too expensive.

SUMMARY.

(1) The cereal varietal question is often libelled through lack of fundamental knowledge with regard to the concept of a variety from the point of view of purity and stability.

(2) Once a variety is fixed for certain characters it is regarded as a pure-line as far as those characters are concerned, and whilst ever self-fertilisation remains absolute it will breed true to type; it will be neither capable of improvement nor deterioration.

(3) There is an allowable agricultural definition of the word "variety" which does not conform strictly to the theoretical constitution of a pure-line. A variety might be defined as a group of plants sufficiently homogenous to constitute a distinct unit which has inherent differences of both physiological and morphological characters that make it readily distinguishable from any other such group of plants.

(4) The purity and stability of a variety is based upon a principle governed by the laws of inheritance, which implies that where self-fertilisation is allowed to proceed without selection, the resultant plant population, after a few generations, will approach complete homozygosity. In other words, a self-fertilised population of plants eventually becomes a mixture of pure-lines.

(5) Plant breeding methods are based on this principle, but to hasten fixation, isolation and perpetuation of certain desirable types is practised from one generation to another until the process evolves a new variety.

(6) A properly fixed variety is inherently just as vigorous many generations removed from the plant breeder as it is when it first leaves his hands, evidence to the contrary is entirely lacking.

(7) When two varieties, whose constitutions are such as to bring about an association of factors which will give expression to the characters of an aboriginal stock, are crossed, true reversion to the ancestral type will occur. The use of the word "reversion" to explain certain irregularities which might exist in varieties in the field is essentially erroneous.

(8) The maintenance of purity after a variety leaves the plant breeder is militated against by both external agencies, which lead to mixture, and internal agencies such as natural crossing, mutation, &c.

(9) Selection within already established varieties does not aim at improvement but at maintaining the variety true to type, true to name, and stable in performance.

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AGENTS IN EVERY TOWN.

AGRICULTURAL EXPERIMENTS IN SOUTH AUSTRALIA.

[By R. C. Scott, Supervisor of Experimental Work.]

(Continued from page 1376.)

EXPERIMENTS IN THE LOWER NORTH.

Apart from miscellaneous experiments dealing with the use of sodium chlorate for the destruction of harmful weeds, the agricultural experiments in progress in this area consist of superphosphate and variety trials with wheat crops at Brownlow and manurial trials with vines in the Clare and Watervale districts.

Both these tests have been recently inaugurated, those at Brownlow being commenced in 1930 and those at Clare and Watervale in 1931. Consequently no conclusions can be drawn from the results obtained. Moreover, it should be borne in mind that the effect of manurial experiments on vines will probably be more apparent in the second year, when their influence on the production of fruit-bearing wood should be more in evidence than in the first year of application.

Typical Brownlow country before clearing.

BROWNLOW EXPERIMENTAL PLOTS.

CONDUCTED ON THE FARM OF MR. G. H. BIAR.

Brownlow is situated on the fringe of the Murray Flats, being about 12 miles south-east of Eudunda and six miles south of Sutherlands. According to the distance travelled toward the east from the range of hills extending from Truro to Eudunda, so does the average rainfall become less and less, and in round figures is reduced by about an inch per mile, reaching a minimum of between 9ins. to 10ins. per annum on the Murray Flats proper.

No official gauge is placed at Brownlow, but the amount recorded at Sutherlands will approximate very closely to that registered on the experimental plots. The soil of the district is of fertile nature, being a red loam type, and in a classification would be included amongst the red brown earth class. In its virgin state the land carried large mallee timber, together with a limited amount of bushy undergrowth. With adequate rainfall conditions this country is capable of carrying very good wheat crops, but because of the relatively heavy nature of the soil it does not respond to the light rainfall as well as land of more sandy type.

Rainfall at Sutherlands.

	1930. Ins.	1931. Ins.	Mean, 1897-1931. Ins.
January	0·00	0·37	0·35
February	0·40	0·00	0·53
March	0·04	0·37	0·66
April	0·73	2·02	0·55
May	0·41	1·64	1·20
June	0·38	1·92	1·41
July	2·05	1·17	1·02
August	2·51	0·91	1·29
September	0·72	1·59	1·23
October	2·61	0·35	1·04
November	0·48	0·52	0·79
December	0·41	0·77	0·73
Totals	10·74	11·63	10·80

Useful Rainfall.

	1930. Ins.	1931. Ins.	1897-1931. Ins.
Seeding Rains (April-May)	1·14	3·66	1·75
Winter Rains (June-July)	2·40	3·09	2·43
Spring Rains (August-September)	5·84	2·85	3·56
Early Summer (November)	0·48	0·52	0·73
Totals	9·86	10·12	8·47

The mean total rainfall calculated over a 34-year period is seen to be 10.80 inches.

In the two seasons during which the experiments have been in progress this average figure was approached in 1930 and exceeded by 83 points in 1931. However, in the matter of Useful Rainfall both years have benefited by falls amounting to considerably above the average, but each was characterised by unusual climatic conditions occurring at some period during the growth of the crop.

In 1930 the month of September proved particularly severe and the climatic conditions experienced at that time militated against maximum yields. In 1931 the rainfall for October and November was considerably below the average, but fortunately steady ripening weather obtained, and crops matured satisfactorily.

With a total rainfall of 10.80 inches and useful rainfall of 8.47 inches this district must be regarded as somewhat risky for wheat-growing operations.

Manurial Experiments at Brownlow.

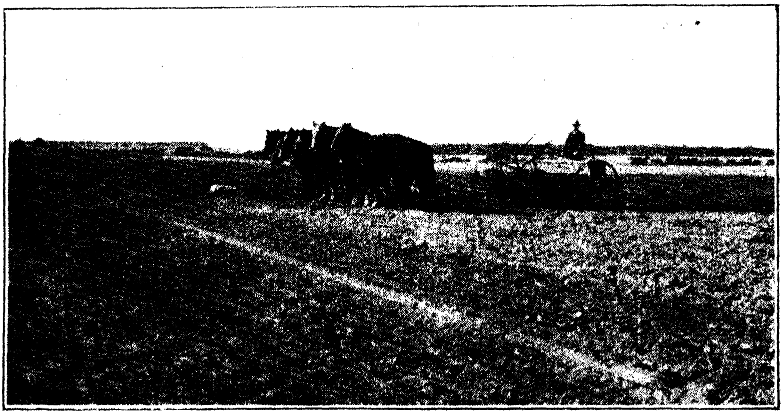
	No Manure.		½cwt. 45 Grade Super. (11½lbs. P_2O_5).		1cwt. 45 Grade Super. (23lbs. P_2O_5).		1½cwts. 45 Grade Super. (34½lbs. P_2O_5).		2cwts. 45 Grade Super. (46lbs. P_2O_5).	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
1930	4	28	5	19	5	29	4	52	5	27
1931	11	47	12	1	13	8	14	58	14	58
	8	7	8	40	9	18	9	55	10	12

For the two seasons in which the experiments have been in progress the average yields have increased with heavier dressings of superphosphate. However, in no case has the difference been appreciable, and at current prices would not meet the expense of the additional fertiliser utilised.

Wheat Varieties—Brownlow.

	1930.		1931.		Mean, 1930-31.	
	B.	L.	B.	L.	B.	L.
Nabawa	3	58	13	8	8	33
Begum	6	37	9	19	7	58
Canberra	3	50	10	17	7	3
Sultan	3	37	9	57	6	47
Federation	3	56	8	53	6	24
Gluyas	5	5	7	30	6	17
Sword	—		9	27	—	
Gluford	—		8	54	—	

The yields from Federation and Sultan may be regarded as the basis for comparison for wheat varieties, as with the exception of Gluyas, the remainder are comparatively new to the district. In 1930 the best yields were secured from Begum and Gluyas, whilst this year Nabawa, Canberra, Sultan, and Sword headed the list.



Seeding the Experimental Plots at Brownlow.

In the two seasons the best averages were obtained from Nabawa (8bush. 33lbs)., Begum (7bush. 58lbs.), and Canberra (7bush. 3lbs) respectively.

These are all recent introductions to the Brownlow district, and appear likely to displace the varieties previously grown.

CLARE EXPERIMENTAL PLOTS.

The experiments in the Clare district are associated with the manuring of vines and are situated at three centres, each varying in soil type and variety of vine planted.

The men conducting the work and the areas on which the plots are placed are:—*Mr. E. H. Mattner,* hilly country east of Clare; *Mr. G. Neate,* Stanley Flat; and *Mr. N. Reid,* Watervale.

The tests are therefore somewhat widely scattered, but were designed with the object of including the three main classes of soil to be found in the district.

The work was only commenced last year, and consequently the results of but a single season are available. However, in order to provide information on the experiment it was considered advisable to publish the details of the work in progress, though a discussion on the results obtained is not possible.

Rainfall at Clare.

The annual rainfall at Clare is 24.54 inches, whilst that received at Watervale is about 2½ inches more, totalling 26.91 inches per annum.

The amount recorded in 1931 was slightly below the mean, whilst the season was characterised by a severe frost which occurred in early October, followed by dry conditions extending through the remainder of the year and continuing until the middle of February of 1932.

The monthly rainfall for 1931, together with the mean fall at Clare over the past 69 years, is as follows:—

Month.	Rainfall. 1931. Ins.	Mean, 1863-1931. Ins.
January	0·68	0·85
February	0·18	0·83
March	1·46	1·01
April	2·50	1·91
May	3·16	2·95
June	4·08	3·36
July	3·59	3·10
August	3·22	3·08
September	2·80	2·84
October	0·75	2·15
November	1·15	1·30
December	0·65	1·16
Total	24·22	24·54
	1932.	
January	0·21	
February	2·02	
March	1·72	

EXERIMENTS ON THE PROPERTY OF MR. E. H. MATTNER.

Mr. Mattner's property is situated in hilly country about two miles to the east of the township. The soil is of relatively heavy nature. It is red in color and contains appreciable quantities of ironstone gravel.

The variety of vines utilised was Pedro, which were spur pruned.

The plots consisted of two rows of vines interspaced by two buffer rows, but in order that each should receive its full dressing of manure the fertiliser was distributed over three divisions in every case.

The vines made good growth during the season, and because of the locality escaped the October frost.

The plan of experiment and the results obtained at the 1932 harvest are as follows:—

Treatment and Manure per Acre.	Total Yield per Plot. Lbs.	Beaume Test.
No Manure	156	15
3cwts. Superphosphate	416	15·5
3cwts. Superphosphate 1cwt. Sulphate Ammonia	420	15·5
3cwts. Superphosphate 1cwt. Sulphate Ammonia 1cwt. Sulphate Potash	334	15·5
1 ton Gypsum	419	15
4 tons Marl (Local Deposit)	407	16
Green Manure (Pease)	356	15

The marl was secured from a local deposit adjoining Mr. Mattner's property, which when analysed by the Director of Chemistry was shown to contain 31 per cent. of lime (CaO). Ordinary agricultural lime contains 45 per cent. of CaO, and after taking the relative fineness of division into account it was considered necessary to apply a dressing of 4 tons per acre to have approximately equal effect to 1 ton of lime.

EXPERIMENTS ON THE PROPERTY OF MR. N. REID.

Mr. Reid's property is placed a little to the south-east of the Watervale township, and is typical of the limestone soils of that area. Unfortunately no results are available from this series, as the frost experienced on October 4th was particularly severe, and not a leaf was left on the vines. Consequently, whilst a light crop was eventually secured, the plots were not harvested individually.

The plan of experiment in progress consists of the following:—

Block.	Treatment and Manure per Acre.
1	No Manure.
2	3cwts. Superphosphate.
3	3cwts. Superphosphate. 1cwt. Sulphate Ammonia.
4	1cwt. Sulphate Ammonia. 3cwts. Superphosphate. ½cwt. Sulphate of Potash.
5	Green Manure (Pease).

EXPERIMENTS ON THE PROPERTY OF MR. CHAS. NEATE.

The plots are situated at Stanley Flat, about 2½ miles north of Clare. The soil is a deep, chocolate-colored loam. The vineyard was planted with Zante Currants in 1910 and the trellises are 11ft. apart, with the vines spaced at 11ft. intervals in the rows. Manure has been applied in previous seasons, 187lbs. of Superphosphate being added in each of the last three years. whilst in addition 1cwt. of Sulphate of Ammonia was utilised in 1930. Frosts have been particularly severe on this area, practically destroying the crop in 1930-31, and rendering difficult the selection of suitable canes when pruning in the following year. Again last season (the first year of the test) a frost occurring on October 4th cut the young shoots and hardly a green leaf was left on the vines. However, as the season advanced they made a splendid recovery and a fair average crop was harvested.

The marl used in these tests was secured from an adjoining deposit and showed an analysis of 24.6 per cent. lime (CaO). Consequently an application of 5 tons per acre was considered necessary.

The superphosphate was drilled into the soil prior to ploughing, whilst the gypsum and lime were spread over the land after ploughing and harrowed in.

The results obtained were as follows:—

Treatment and Manure per Acre.	Total Yield per Plot. Fresh Fruit. Lbs.	Dry Fruit. Lbs.	Weight of Cuttings. 1931. Lbs.	1932. Lbs.
No Manure	4,032	1,180	133	129
3cwts. Superphosphate	5,346	1,568	152	152
1 ton Gypsum	4,180	1,170	168	168
5 tons Marl	5,742	1,675	171	173
Green Manure	3,938	1,148	158	172

Each plot consists of 120 vines, planted 11ft. apart in each direction, and therefore the area covered in every case is one-third of an acre.

AGRICULTURAL EXPERIMENTS ON YORKE PENINSULA.

Several series of Agricultural experiments are in progress on Yorke Peninsula. Those connected with the Manganese Deficiency of Soils have already been reported on, and the results were published in a previous issue of the *Journal of Agriculture* (Volume XXXV., No. 7).

The remaining tests deal with manurial and variety trials with wheat and malting barley, and are situated at Urania, South Kilkerran, and Brentwood. The experiments at Urania have been in operation for the longest period, and were commenced in 1927, whilst those at South Kilkerran and Brentwood have only been in progress for two and one year respectively.

The three first-named districts adjoin each other, lying from 7 to 10 miles south to south-east of Maitland. The most central official rainfall recording station is at Port Victoria, which lies about 7 miles to the eastward of these areas. However, the rainfall received on the experimental plots would approximate very closely to that recorded at Port Victoria, and therefore it has been decided to publish the records of that station as indicating the rainfall conditions under which these tests are being conducted:—

Rainfall at Port Victoria.

Month.	1927. In.	1928. In.	1929. In.	1930. In.	1931. In.	Means. 1927-31. In.	Means. 1879-31. In.
January	0·18	0·50	0·20	0·00	0·62	0·30	0·44
February	0·82	1·80	0·45	0·51	0·03	0·72	0·50
March	0·96	0·35	0·26	0·02	0·58	0·43	0·67
April..........	0·18	0·29	0·45	1·05	0·84	0·56	1·31
May	1·43	1·69	1·41	0·83	2·63	1·60	2·07
June	0·97	1·93	2·07	0·45	3·11	1·71	2·29
July	2·14	1·80	1·93	2·98	1·95	2·16	1·89
August	1·82	0·63	1·86	3·02	2·15	1·90	1·90
September	0·48	1·02	1·90	1·44	2·23	1·41	1·53
October	0·04	2·03	0·52	1·56	0·69	0·97	1·25
November	2·50	0·45	1·09	0·49	0·46	1·00	0·84
December	0·90	0·15	4·39	1·33	0·24	1·40	0·71
Totals	12·42	12·64	16·53	13·68	15·53	14·16	15·40

"Useful" Rainfall.

Seeding Rains (April-May) .	1·61	1·98	1·86	1·88	3·47	2·16	3·38
Winter Rains (June-July) ..	3·11	3·73	4·00	3·43	5·06	3·87	4·18
Spring Rains (Aug.-Oct.) ..	2·34	3·68	4·28	6·02	5·07	4·28	4·68
Early Summer (November) .	2·50	0·45	1·09	0·49	0·46	1·00	0·84
Totals	9·56	9·84	11·23	11·82	14·06	11·31	13·08

The above tables indicate the total and useful rainfall recorded during the past five years comparatively with the means for 1927-31 and 1879-31. It will be noted that for the five seasons during which the Urania plots have been in existence the total rainfall has been 1.34 inches below the mean for the district. In 1929 the amount recorded exceeded the average, largely because of exceptionally heavy rains occurring in the month of December. The 1931 fall was practically equal to the mean, but that for each of the remaining three years was considerably lower. The Useful Rainfall table shows that last season was very satisfactory in this respect, as the amount recorded was practically an inch above the normal precipitation. However, the other years have been relatively poor, and vary from 3¼ to 1¼ inches below the average.

The respective seasons have each been characterised by special features, which may be summarised as follows:—

1927.—Relatively poor seeding conditions, followed by a dry September and October, which reduced crop yields.

1928.—Throughout the year the rainfall was below average, but crops made fair headway until a dry August checked development.

1929.—In this season exceptionally poor rains during the month of October, accompanied by warm weather, hastened maturity and depreciated crop returns.

1930.—Satisfactory opening rains were not received until early in July. Warm summer conditions were experienced in November, and therefore the crops were permitted only a short growing period.

1931.—Favorable conditions prevailed throughout the year until the month of October. Fortunately the weather remained cool and crops matured well.

EXPERIMENTS ON THE PROPERTY OF MR. A. W. KELLY, URANIA.

Mr. Kelly's farm is situated immediately to the south-west of the Urania township, and is placed in country typical of much of the better-class land on Yorke Peninsula.

Before clearing it carried medium sized mallee timber with abundance of bushy undergrowth.

The soil itself is of limestone nature overlying loose limestone rock, which in many fields accumulates on the surface and necessitates removal. It is fertile in nature and capable of producing high yields of good quality grain.

The experimental plots comprise tests with manures and wheat varieties, and have promoted considerable interest amongst farmers of the district.

Manurial Experiments, Urania.

Year.	No Manure.		½cwt. 45 Grade Super. (11½lbs. P_2O_5).		1cwt. 45 Grade Super. (23lbs. P_2O_5).		2cwts. 45 Grade Super. (46lbs. P_2O_5).		3cwts. 45 Grade Super. (69 lbs. P_2O_5).	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
1927	7	56	10	15	10	34	12	20	13	16
1928	4	33	6	29	8	38	9	45	10	45
1929	8	49	11	5	18	50	19	54	22	5
1930	10	19	13	35	15	3	16	18	16	32
1931	25	55	33	25	31	55	35	55	36	2
Means, 1927-1931	11	30	14	58	17	0	18	50	19	44
	£ *s.* *d.*		£ *s.* *d.*		£ *s.* *d.*		£ *s.* *d.*		£ *s.* *d.*	
Value at 3s. 4d. per bush.	1 18 4		2 9 11		2 16 8		3 2 9		3 5 9	
Net Value with Super. at 5s. per cwt.	1 18 4		2 7 5		2 11 8		2 12 9		2 10 9	

The yields obtained from the different plots have been very regular so far as their respective positions are concerned, as with the exception of 1931 they have gradually increased according to the additional quantity of Superphosphate applied. The highest return has been secured from the 3cwt. dressing, namely, 19bush. 44lbs. per acre, with 18bush. 50lbs., 17bush., 14bush. 58lbs., and 11bush. 30lbs. for the 2cwt., 1cwt., ½cwt., superphosphate and No Manure plots respectively.

When these yields are converted to a cash value by allowing 3s. 4d. per bushel for the grain and 5s. per cwt. for the superphosphate, the maximum profit follows the 2cwt. manuring. This plot has returned 1s. 1d. per acre more than the 1cwt. and 2s. per acre more than the 3cwt. dressing.

On the above basis, therefore, it would appear that the limit for profitable Superphosphate manuring lies within the vicinity of 2cwts. per acre.

In addition to the Superphosphate experiments, a plot receiving phosphoric acid equivalent to the 2cwt. dressing, but also obtaining 5½lbs. of Nitrogen and 5lbs. of Potash per acre was included.

The object was to ascertain whether wheat would respond to dressings of a complete fertiliser, but in the two seasons in which the test has been conducted the yields have been 16bush. 21lbs. and 35bush. 5lbs., comparatively with 16bush. 18lbs. and 35bush. 55lbs. per acre from 2cwt. superphosphate dressing only. There is, therefore, very little difference in the respective returns, and apparently the addition of either Nitrogen or Potash is of little value to wheat crops in this district.

WHEAT VARIETY EXPERIMENTS.

Mr. Kelly is particularly interested in the variety experiments, and from time to time has included additional varieties for seeding in this test. Consequently it is not possible to calculate the averages for all wheats over the five-year period, and therefore two sets of means are shown in the following table.

Wheat Varieties, Urania.

Variety.	1927.		1928.		1929.		1930.		1931.		Means., 1927-31.		Means., 1929-31.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Nabawa	18	45	11	17	20	6	19	32	34	47	20	53	24	48
Caliph	18	51	9	45	19	54	16	18	35	55	20	9	24	2
Sultan	16	59	8	36	21	29	17	30	32	43	19	27	23	54
Gluford	17	20	11	21	15	56	17	46	32	42	19	1	22	8
Waratah	16	23	10	42	18	31	17	26	31	18	18	52	22	25
Dan	16	11	11	24	17	59	17	1	30	56	18	42	21	59
Daphne	14	52	10	21	19	57	16	32	30	56	18	32	22	28
Nawab	—		—		20	43	17	54	37	2	—		25	13
Sword	—		—		22	52	18	30	33	11	—		24	51
Begum	—		—		21	31	14	52	33	8	—		23	10
Ford	—		—		18	33	17	21	33	20	—		23	5
S.H.J.	—		—		—		17	47	30	18	—		—	
Jones Wonder	—		—		—		—		34	33	—		—	

Examination of the yields over the five-year period shows that Nabawa is at the head of the list with 20bush. 53lbs., followed by Caliph 20bush. 9lbs. and Sultan 19bush. 27lbs.

Comparing the varieties included in this mean, it would appear that the three mentioned are the most valuable for the district and are to be preferred to either Gluford, Waratah, Dan, or Daphne.

Caliph has given the highest return in two out of the five seasons under review, whilst Nabawa and Sultan have each headed the averages on one occasion. They are all well-known varieties, and their ability to thrive in limestone soils and ripen their grain under adverse seasonal conditions is generally recognised. However, when the means for the three years, 1929, 1930, and 1931, which includes new varieties, are considered, it will be seen that they have been displaced by both Nawab and Sword. The latter is only a few pounds ahead of Nabawa, but Nawab has exceeded the average for this wheat by the appreciable amount of almost half a bushel per acre. Both were bred at Roseworthy Agricultural College, where they exhibited considerable promise in the seed plots. Nawab was produced by crossing Anvil (King's White x Jonathan) with Sultan, whilst Sword is the result of mating Sultan (King's White x Caliph) with Ford. The results obtained with these two varieties both at Urania and in other parts of the State are most satisfactory, and lead one to think that they will eventually prove very valuable wheats for the limestone soils of South Australia.

EXPERIMENTS ON THE PROPERTY OF MR. W. A. HEINRICH, SOUTH KILKERRAN.

The work being conducted by Mr. Heinrich consists of a series of tests laid down with the object of determining the influence of various manurial dressings on the yield and malting quality of Prior barley.

Work was commenced in 1930, and therefore we have the results from two seasons to tabulate, but the period is too short to allow comment on the yields obtained.

The climatic and soil conditions under which these experiments are placed are very similar to those at Urania.

Manurial Experiments with Pryor Barley.

Manure per Acre.	1930.		1931.		Means. 1930-31.	
	B.	L.	B.	L.	B.	L.
No Manure	22	25	24	9	23	17
½cwt. 45 per cent. Super. (11½lbs. P_2O_5)	24	11	27	4	25	33
1cwt. 45 per cent. Super. (23lbs. P_2O_5)	25	3	25	25	25	14
1½cwts. 45 per cent. Super. (34½lbs. P_2O_5)	26	34	29	6	27	45
2cwts. 45 per cent. Super. (46lbs. P_2O_5)	26	29	29	34	28	7
2cwts. Complete Orchard Manure (29lbs. P_2O_5, 11lbs. N., 10lbs. K.)	26	2	30	16	28	9
1cwt. 45 per cent. Super. (23lbs. P_2O_5) 56lbs. Sulphate Ammonia (11lbs. N.)	25	11	29	49	27	30
1cwt. 45 per cent. Super. (23lbs. P_2O_5) 45lbs. Chloride Ammonia (11lbs. N.)	—		29	49	—	

In both seasons the barley has been seeded on wheat stubble land

There is no appreciable difference in the yields from the various plots which have received the fertilisers, although that secured from the 1cwt. of Superphosphate plot in the 1931 harvest appears to have been depressed by some unexplained factor.

Each season Mr. A. G. Barrett, of Messrs. Barrett Bros., maltsters, of Adelaide, has kindly examined the grain harvested and expressed an opinion as to the malting quality of the various samples. The substance of his remarks is as follows—

1930.—"These are all good samples and do not exhibit great variation. So far as the best malting grain is concerned, two samples may be bracketed together, namely, that from the plot receiving 1cwt. of Superphosphate plus ½cwt. of Sulphate of Ammonia and that from the 1½cwts. of Superphosphate dressing only. However, the barley from the Ammonia plot is slightly fuller. Applications of 1cwt. of superphosphate, ½cwt. superphosphate, and 2cwts. of Complete Orchard Manure have produced grain of similar quality, and these samples may be grouped together. The poorest barley is that harvested from the 2cwts. of superphosphate and No Manure plots, but the differences between any of the samples are not great."

1931.—"The order of quality appears to be 1cwt. Superphosphate, plus 45lbs. Chloride of Ammonia; 2cwts. Complete Orchard Manure; 1cwt. Superphosphate plus 56lbs. Sulphate of Ammonia; ½cwt. Superphosphate; 1½cwts. Superphosphate; No Manure; 2cwts. Superphosphate; 1cwt. Superphosphate.

The Complete Orchard Manure, Chloride of Ammonia, and Sulphate of Ammonia dressings have all led to improvement over the superphosphate only plots, particularly regarding the regularity and plumpness of the grain. There is little difference between the barley from these three manurings, but probably that from the Complete Manure was the best and that from the Chloride of Ammonia slightly better than that from the Sulphate of Ammonia plot.

The grain from the 1cwt. of Superphosphate plot varies from the remainder and appears to be affected by some factor other than the quantity of manure used."

EXPERIMENTS ON THE PROPERTY OF MR. O. H. HEINRICH, SOUTH KILKERRAN.

The object of the experiments in progress on the property of Mr. O. H. Heinrich is to ascertain whether it is possible to secure malting barley varieties which would be an improvement on the type now being grown on Yorke Peninsula, namely, Prior.

In this connection small quantities of seed of nine varieties were imported into South Australia, five being secured from the Department of Agriculture in New Zealand as representing the best barleys in that country, and four from Mr. H. Pye, Cerealist at Dookie Agricultural College, Victoria.

These were seeded comparatively with Pryor and the results secured over the last two seasons are shown in the following table:—

Malting Barley Variety Experiments.

Variety.	1930.		1931.		Means, 1930-31.	
	B.	L.	B.	L.	B.	L.
Early Challenger	17	14	32	44	25	4
Prior	16	46	28	0	22	23
Bevan Special	13	16	24	46	19	6
Kinver Chevalier	14	5	22	16	18	11
Plumage	14	2	21	37	17	45
Plumage Archer	12	16	22	2	17	9
Goldthorpe Spratt	11	11	20	26	15	44
Archer Spratt	14	6	—		—	
Spratt's Archer	12	4	—		—	
Danish Archer	8	23	—		—	

In both years the highest return has been harvested from Early Challenger, a variety obtained from Victoria, and on the averages this barley has exceeded the yield from Prior by 2bush. 32lbs. per acre.

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The remaining types are much later in maturing than either Early Challenger or Prior, and therefore in each year they have encountered relatively unfavorable conditions for developing their grain.

The samples obtained from the different varieties were submitted to Mr. Barrett, who expressed the following opinion:—

1930.—"Goldthorpe Spratt is a very even and attractive grain, and if a little better filled would be a first-class barley. Plumage Archer is but slightly inferior to Goldthorpe Spratt. Early Challenger, Plumage, Kinver Chevalier, and Bevan Special are all good barleys and very difficult to separate. Early Challenger has yielded grain very similar to Prior in characteristics. I would place these four varieties in on a lower grade than either Plumage Archer or Goldthorpe Spratt.

The remaining samples are not equal to those mentioned above, and judged on the merits of the grain submitted do not appear worth continuing with."

1931.—"Provided that well developed grain can be regularly produced under our soil and climatic conditions, the following varieties are of good malting type:—

Plumage.
Plumage Archer.
Scotch Plumage.
Bevan Special.
Goldthorpe Spratt.
Early Challenger.

The latter is very similar to Prior except that the basal bristle is slightly less hairy."

In both years Mr. Barrett has pointed out the similarity of the grain from Prior and Early Challenger varieties, and examination in the field has led us to the conclusion that the latter is a selected strain of Prior barley.

It is therefore of the type familiar to maltsters, and as it has the highest average yield appears to be the most valuable of the barleys included in the experiments. Prior has now been grown for a number of years and is the leading malting barley in South Australia, but largely because there is no cereal breeding station established in a malting barley district very little work has been done in the isolation and building up of superior strains.

Probably work of this nature would be more important than attempting to introduce new varieties, as even if these were successful, so far as yield is concerned, they may be difficult to establish if they should necessitate any alteration to the plant of the malthouse. The selection of Prior barley has now been taken in hand at Roseworthy Agricultural College. Several strains are being built up, and when sufficient grain is available arrangements will be made for testing them on Yorke Peninsula.

EXPERIMENTS ON THE PROPERTY OF MR. J. H. BOUNDY, BRENTWOOD.

Another series of variety tests were established last year on the property of Mr. J. H. Boundy, which is situated about seven miles to the south-west of Minlaton and almost on the instep of the Peninsula.

Malting Barley Variety Experiments, 1931.

Variety.	Yield per Acre.	
	B.	L.
Early Challenger	35	26
Prior	32	33
Plumage	24	17
Kinver Chevalier	23	33
Scotch Plumage	21	31
Plumage Archer	20	13
Scotch Maltster	20	2

Here again Early Challenger has given the highest yield, although it obtained some advantage from the fact that weather delayed seeding for some days after this variety was drilled in.

Included in this test were two varieties imported from England, namely, Scotch Plumage and Scotch Maltster. The yields were not very satisfactory, but they may improve as they become more acclimatised.

DESTRUCTION OF TREES AND THE EFFECT ON RAINFALL.

[By E. BROMLEY, Divisional Meteorologist.]

The effect of the destruction of trees on rainfall (and climate generally) should be examined from two aspects—

1. The effect on the country *surrounding* the area on which the trees were located, *i.e.*, adjacent effect.

2. The effect on the country over which the trees were located, *i.e.*, local effect.

The necessity for a distinction follows from the obvious deduction that if a forest were not destroyed the country would be of very little economical value for anything other than a forest.

In regard to (1) statistical evidence is not satisfactory, but what is available supports the view that rainfall over open country is *not affected* by the destruction of a neighboring forest.

In regard to (2) statistical evidence suggests that the existence of a forest *increases* the rainfall by a very small amount—*about 2 per cent.*—over the country on which it is located.

The theoretical considerations in this aspect are as follows:—

(*a*) A compact mass of trees, say 30ft. high, increases the effective height of the country by that amount, and would consequently increase the tendency for orographical rain. This is perhaps the most important point, and is responsible for the greater portion of the effect.

(*b*) The greater friction of the wind with the tree surface compared to open ground may lead to a very slight increase in rainfall.

(*c*) In favorable mountain situations a slight increased supply of water may be collected mechanically from the clouds which envelop the forest.

(*d*) Under favorable conditions a slight increase in prevailing humidity may increase the rainfall slightly. This would probably occur only in an already wet climate.

The most satisfactory evidence in regard to aspect (2) is derived from an experiment at Waggon Wheel Gap, Colorado, U.S.A.

Two similar watersheds of about 200 acres extent, equally covered with forests, were selected and observations carried out for seven years. One area was then deforested and observations continued for another seven years.

The result of the investigations showed a net *decrease* of 40 points in an annual average rainfall of 21in., or about 2 *per cent.* over the deforested area.

Some results from an investigation in Sweden also suggest an increase of about 1 per cent. due to the presence of a forest, and in Germany some results indicated a probable increase of 1 to 2 per cent. in the rainfall.

It is interesting to note that theory suggests that the replacement of forests by field crops or grass lands will increase the rainfall slightly, *i.e.*, field crops or grass covered grounds are more effective than forests in increasing transpiration of water into the air.

In support of this, an investigation by E. T. Quayle suggested an increase of three per cent. in the spring rainfall of north-west Victoria as a result of the replacement of Xerophilous forest and scrub by growing crops.

On the other hand, an examination of rainfall in two consecutive 25-year periods over the Great Plains States, U.S.A., showed the following facts:—Average rainfall for first 25 years was 19.3in.; and for the second 25 years it was 18.6in., or a *decrease* of about 3 per cent.; yet the area under crop was *increased* from 18 million acres at the end of the first 25 years to 54 million acres at the end of the second period. No data were given in respect to what forest cover, if any, existed prior to or during settlement.

Returning to Aspect (1) and the Waggon Wheel Gap experiment, the variations in the various elements between the two periods on the undenuded area were either completely negligible or of such a small order as might be expected in any two seven-year periods, *e.g.*, the rainfall increased by 13 points, or about a ½ per cent.

The destruction of the forest on the neighboring area, therefore, apparently had no effect on the adjacent country. (In fact, the wind velocity *decreased* by a very small amount; it might have been expected to *increase*).

In admitting the possibility of some slight increase over the local country, it appears obvious that the greater the area, thickness, and height of the forest, the greater will be the effect, and it seems equally obvious *that the destruction of isolated clumps of trees will pass practically unnoticed in any effect on rainfall.*

It seems an obvious deduction also that the drier the climate generally, the less likely will there be any effect, *e.g.*, a forest of, say, 1,000 acres in the Lower South-East of South Australia may produce a slight increase in rainfall in its own area; but a 1,000 acre forest in the Lake Eyre region would be quite ineffective. It should be remembered that it is the rainfall which enables a forest to grow in the first place (except that irrigation might be employed in small areas.)

It is nevertheless generally conceded that the growing of a belt of trees as a wind break is effective for some distance beyond the trees, while regulation of stream flow and reduction of erosion follow from the planting of trees, although field crops and grass lands are considered to be quite as effective as trees in the control of drainage.

It might be interesting to give the comparative figures for elements besides rainfall, from the Waggon Wheel Gap experiment, showing the effect of deforestation on the country itself, *i.e.*, Aspect (2). In addition to the 40 points decrease in rainfall, the removal of the forest cover resulted in a nett increase of about two degrees in the mean maximum temperature, an increase of about one degree in the mean minimum; an increase of 2½ miles per hour in mean wind velocity. The average date of snow melting was four days earlier, underground temperatures were from two to three degrees warmer, and there was a reduction of 5 per cent. in the relative humidity. The total run-off (stream-flow) over an extended period increased by 15 per cent., or the percentage of precipitation appearing as run-off increased from 29 to 35 per cent., while in short periods, following heavy rains, the run-off increased by 40 per cent.

Erosion was increased seven-fold, but even this may be a low figure, as such depends greatly on the nature of the soil.

SORE SHOULDERS.

The following remedy for sore shoulders, which Mr. W. J. Spafford (Deputy Director of Agriculture) said had cleared up a very serious outbreak amongst the horses at Roseworthy Agricultural College, was recommended to farmers at the Murray Lands Conference at Karoonda on August 2nd by Mr. W. G. Bennett, B.V.Sc. (Veterinary Lecturer Roseworthy Agricultural College):—Paint the shoulders with a mixture of neatsfoot oil and either white lead or zinc white, of a consistency of separated cream, to which can be added 1 tablespoonful of boracic to the pint. This should be done *every* morning before the horse goes out. Every night when the horse comes in the shoulders should be washed down thoroughly with a strong solution of salt (or wattle bark) and the collars thoroughly cleaned.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR AUGUST.

[By CHAS. H. BEAUMONT, District Horticultural Instructor.]

The work of pruning will have now been completed. All big cuts should have a coat of paint. Thoroughly clean pruning implements before putting away.

Winter treatment of trees which have been subject to fungous diseases should be completed. Use winter strength Bordeaux. Curl leaf, shot hole, and scab can be materially lessened by this treatment.

Keep watch for aphis on peach, plum, and citrus trees, and on beans. Use black leaf 40 or nico dust; early treatment saves a lot of trouble and damage.

Anthracnose on vines must be dealt with at once if any good is to result. A pamphlet may be had on application describing the method. Enclose stamp for reply.

Take off all citrus fruits showing signs of brown rot, and pick up all windfalls and destroy them.

Where it is intended to apply sulphate of ammonia or other manures, work well into the soil this month.

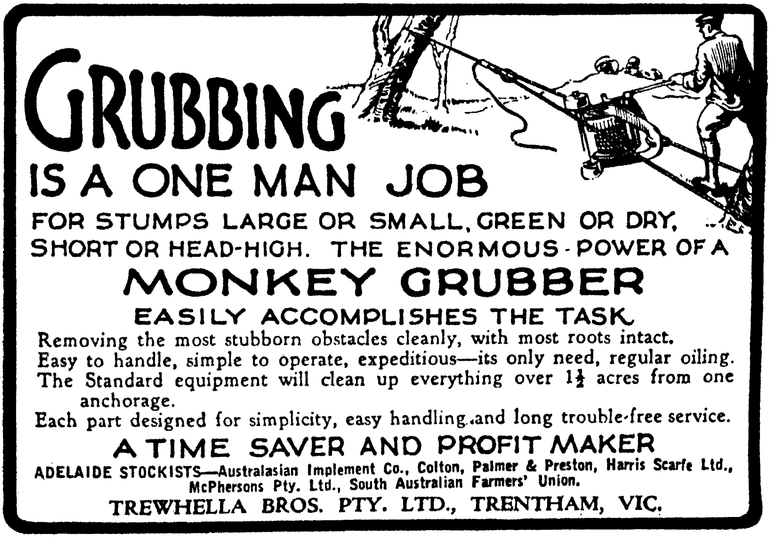
It is most important that the soil be got into good tilth as early as possible, especially about the trees and vines. We have had bountiful rains and we should do our best to make good use of them.

Keep beds of strawberries well worked.

Take out and destroy all sickly plants in the tomato-houses; keep soil loose and free from weeds, and remove all weeds from about the houses. Watch for cut-worm, and use arsenate of lead if noticed. Use nico dust for white fly.

There is no cure for Irish blight of potatoes, but it can be prevented by the use of Bordeaux mixture. The time to apply is when the plants are a few inches high; and again in a few weeks if required. The under side of the leaves must be coated with the mixture as well as the tops; it may be used wet or dry. Destroy all sickly plants.

Have spraying outfit in good order and ready for use.



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PURE-BRED COWS COMPLETED OFFICIAL TEST

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved .
JUNIOR TWO-YEAR-OLDS—				
Not allotted	Murray Glen Griselda Tulip	C. J. Morris, Monteith	Friesian	27/8/31
31104	Hampden Lady Olive	J. A. J. Pfitzner, Hampden	Jersey	15/7/31
31074	Glen Ewin Morn's May 2nd	J. McEwin, Houghton	"	20/9/31
34327	Melvin Viola 2nd	C. E. Verco, Mount Compass	"	5/8/31
Not allotted	Murray Glen Griselda's Lassie	C. J. Morris, Monteith	Friesian	14/9/31
"	Para Wirra Iris Pansy	J. H. Dawkins, Gawler	Jersey	3/9/31
31018	Sweet Haven Flower	J. M. Bray, Langhorne's Creek	"	21/7/31
Not allotted	Bess 5th of Kiama	E. & A. Nicholls, Woodville	A.I.S.	31/3/31
28096	Pella Solanum Sunshine	W. P. Eckermann, Eudunda	Jersey	6/7/31
31136	Wooroora Lassie	A. B. Sieber, Eudunda	"	21/7/31
Not allotted	Tuela Delphinium	F. Coleman, Saddleworth	"	12/8/31
"	Pembroke Patience	Mrs. C. W. Ansell, Bletchley	"	5/8/31
33169	Glenavon Princess	A. P. Spehr, Mount Gambier	"	22/9/31
31156	Scrub View Dainty's Lass	A. B. A. Weckert, Brinkworth	"	4/4/31
31155	Scrub View Cherry	A. B. A. Weckert, Brinkworth	"	15/9/31
31146	Pella Silver Queen	C. E. Verco, Mount Compass	"	19/9/31
Not allotted	Tuela Sage	F. Coleman, Saddleworth	"	17/8/31
"	Kyby Ornate	Government Farm, Kybybolite	Ayrshire	12/7/31
"	Tuela Didiscus	F. Coleman, Saddleworth	Jersey	24/7/31
31147	Morella Belle 5th	H. R. Walsh, Salisbury	"	3/5/31
28142	Brinkworth Jewel	C. C. T. Ottens, Brinkworth	"	15/4/31
31102	Hampden Juanita	J. A. J. Pfitzner, Hampden	"	3/4/31
28094	Pella Solanum	W. P. Eckermann, Eudunda	"	11/4/31
28058	Crofton Sunflower	H. and A. Bohne, Balhannah	"	2/6/31
31080	Para Vale Lady Starbright	A. J. Marrett, Saddleworth	"	10/8/31
Not allotted	Waughope Slasher 4th	Dunleith Pastoral Co., Ashbourne	A.I.S.	14/4/31
"	Mayflower 7th of Kiama	E. and A. Nicholls, Woodville	"	30/4/31
31005	Pembroke Fashion	Mrs. C. W. Ansell, Bletchley	Jersey	24/4/31
31149	Morella Princella 3rd	H. R. Walsh, Salisbury	"	28/7/31
31137	Wooroora Princess Lotus	A. B. Sieber, Eudunda	"	12/7/31
Not allotted	Balaklava Patience	A. E. Middleton, Balaklava	"	17/5/31
"	Kyby Vanity	Government Farm, Kybybolite	Ayrshire	9/9/31
"	Balaklava Collegian's Rosette	A. E. Middleton, Balaklava	Jersey	11/9/31
31123	Roseworthy Floral	Agricultural College, Roseworthy	"	25/4/31
Not allotted	Kyby Gladys	Government Farm, Kybybolite	Ayrshire	3/9/31
"	Roseworthy Princess 42nd	Agricultural College, Roseworthy	Jersey	7/9/31
"	Tuela Spruce	F. Coleman, Saddleworth	"	11/7/31
"	Ontario Kitty	T. B. Brooks, Clarendon	"	11/8/31
"	Fernden Lady Belle	E. O. Traeger, Eudunda	"	6/6/31
31097	Delma Dorothy	E. W. Pfitzner, Eudunda	"	20/6/31
31082	Para Vale Queen	A. J. Marrett, Saddleworth	"	6/4/31
3214	Waughope Redwing 4th	Dunleith Pastoral Co., Ashbourne	I.M.S.	25/4/31
3211	Waughope Dot 4th	Dunleith Pastoral Co., Ashbourne	"	28/6/31
Not allotted	Tuela Aquilegia	F. Coleman, Saddleworth	Jersey	30/7/31
"	Morella Damsel 5th	H. R. Walsh, Salisbury	"	21/8/31
3210	Waughope Bonnie 9th	Dunleith Pastoral Co., Ashbourne	I.M.S.	22/4/31
31070	Eudunda Ruby	W. S. McAuliffe, Eudunda	Jersey	28/11/31
Not allotted	Myrtle Bank Edith 2nd	W. A. Rodda, Brooklyn Park	"	2/7/31
"	Roseworthy Princess 39th	Agricultural College, Roseworthy	"	9/7/31
31145	Pella Fairy Lotus	C. E. Verco, Mount Compass	"	30/3/32
Not allotted	Balaklava Collegian's Lubra	A. E. Middleton, Balaklava	"	3/3/32
SENIOR TWO-YEAR-OLDS—				
21829	Eudunda Rhonda's Pride	W. S. McAuliffe, Eudunda	Jersey	22/4/31
28168	Morella Princella 2nd	H. R. Walsh, Salisbury	"	23/8/31
Not allotted	Robin 2nd of Kiama	E. & A. Nicholls, Woodville	A.I.S.	25/8/31
28130	Penrhyn Rhodesia 21st	W. S. McAuliffe, Eudunda	Jersey	21/8/31
28137	Balaklava Skylee's Colleen	A. E. Middleton, Balaklava	"	2/8/31
28051	Pembroke Daisy	Mrs. C. W. Ansell, Bletchley	"	3/6/31
24991	Brinkworth Ruby	C. C. T. Ottens, Brinkworth	"	7/4/31
28128	Eudunda Rhonda's Glory	W. S. McAuliffe, Eudunda	"	5/8/31
Not allotted	Anama Pontiac Pride	W. Hawker, Clare	Friesian	31/8/31
2997	Barina Konigen Gem	L. H. & P. C. Giles, Auburn	"	18/4/31
28108	Burnlea Blandina 2nd	J. M. Hudd, Bletchley	Jersey	20/8/31
31044	Melvin Viola	H. Follett, Langhorne's Creek	"	13/8/31
Not allotted	Ontario Firefly	T. B. Brooks, Clarendon	"	5/5/31
"	Talmont Hazel	A. J. Manoel, Birdwood	Ayrshire	14/8/31

BETWEEN JANUARY 1st AND JUNE 30th, 1932.

Age at Calving.	Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Yrs. Days.	Lbs.	%	Lbs.			
Butterfat Standard, 230lbs.						
2 23	10,959	4·65	509·30	273	River Glen Lord Echo Griselda	—
1 277	7,602	5·25	399·48	273	Mayflower's Lad of Hampden	—
2 47	7,194	5·37	386·21	273	Brucevale Lord Fancy Starbright	—
1 328	6,346½	5·72	363·00	273	Rotford Julian	—
2 27	10,572	3·43	362·99	273	River Glen Lord Echo Griselda	—
2 55	6,480	5·47	354·18	273	Para Wirra Millie's Twylish 2nd	—
1 265	6,513	5·29	344·28	273	Sweet Haven Duke	—
2 143	8,571	3·96	339·21	273	Viscount of East View	—
2 143	6,168	5·45	336·06	273	Melford's Butter Lad of Pella	—
1 159	5,539½	5·92	327·83	273	Wollingurry Cavalier's Silver King	—
1 342	6,418½	5·07	325·16	273	Baron of Dalebank	—
1 237	6,384	5·09	325·11	273	Twylish of Para Wirra	—
1 298	5,682	5·65	321·23	273	Murta Lloyd	—
1 347	6,474	4·95	320·53	273	Holly's King of Hampden	—
2 60	5,362½	5·93	318·20	273	Holly's King of Hampden	—
1 189	5,643	5·60	315·80	273	Wollingurry Cavalier's Silver King	—
1 330	6,144	5·03	308·87	273	Baron of Dalebank	—
1 287	7,239	4·15	300·40	273	Loyalty of Bridge View	—
1 333	5,838	5·14	299·91	273	Baron of Dalebank	—
2 11	6,370½	4·69	298·73	273	Morella Anemone's Chief	—
1 286	5,393½	5·52	297·58	273	General Chris of Penrhyn	—
1 278	5,106	5·80	295·92	273	Hampden Olive's King	—
2 154	6,304½	4·69	295·51	273	Melford's Butter Lad of Pella	—
2 98	5,541	5·22	289·02	273	Butter King of Pella	—
1 279	5,626½	5·13	288·70	273	Brucevale Lord Fancy Starbright	—
2 2m.	7,227	3·88	280·61	273	Garnet of Brush Grove	—
2 106	8,016	3·44	275·38	273	Viscount of East View	—
1 230	5,038½	5·29	266·76	273	Twylish of Para Wirra	—
1 346	4,503	5·65	254·37	273	Morella Anemone's Chief	—
1 149	3,988½	6·31	251·74	273	Wollingurry Cavalier's Silver King	—
1 290	3,897	6·30	245·32	273	Oliver of Hampden	—
2 43	6,126	3·98	243·68	273	Loyalty of Bridge View	—
1 333	4,965	4·91	243·95	273	Balaklava Skylee's Collegian	—
1 262	4,062	5·87	238·48	273	Roseworthy Templar	—
2 2ms.	5,316	4·48	238·35	273	Loyalty of Bridge View	—
1 295	4,272	5·48	233·93	273	Mercedes Sweet Duke of Glen Iris	—
1 338	4,123½	5·58	230·24	273	Baron of Dalebank	—
2 17	4,186½	5·46	228·46	273	Para Wirra Cherry's Twylish	—
1 222	3,858	5·58	215·24	273	Werribee Combination	—
1 193	3,759	5·72	215·01	273	Beauty's King of Somerville	—
1 239	3,940½	5·45	214·69	273	Werribee Combination	—
2 66	5,669	3·74	212·16	273	Garnet of Brush Grove	—
2 80	4,980	4·11	204·88	273	Waughope Sinbad	—
1 358	4,005	4·57	183·02	240	Baron of Dalebank	**Dried off**
1 196	3,223½	5·43	174·94	273	Anemone's Chief of Morella	—
2 59	4,159	3·97	165·09	273	Garnet of Brush Grove	—
1 289	3,495	4·62	161·31	150	Ruby's Repulse of Eudunda	Sold
1 244	2,929½	5·43	159·08	273	Annette's Chief of Linden	—
1 353	2,115	5·38	113·69	240	Mercedes Sweet Duke of Glen Iris	**Dried off**
2 46	1,545	5·08	78·56	60	Wollingurry Cavalier's Silver King	**Sold**
1 285	360	3·96	14·27	30	Balaklava Skylee's Collegian	**Withdrawn**
Butterfat Standard, 250lbs.						
2 215	7,230	6·23	450·57	273	Myrtle Bank Kate's Chief	—
2 326	6,726	6·27	422·02	273	Anemone's Chief of Morella	—
2 201	10,159½	3·89	395·24	273	Viscount of East View	—
2 196	7,240½	5·30	383·43	273	Roderick of Penrhyn	—
2 312	7,158	5·29	378·80	273	Balaklava Skylee Collegian	—
2 275	5,589½	6·66	369·01	273	Twylish of Para Wirra	—
2 325	6,694½	5·23	349·79	273	Beauty's King of Somerville	—
2 190	5,977½	5·63	336·34	273	Myrtle Bank Kate's Chief	—
2 312	10,168½	3·22	327·65	273	Inavale Lady's Pride	—
2 253	11,209½	2·87	321·64	273	River Glen Pietje Posch	—
2 350	5,566½	5·57	310·27	273	Mack of Glenford	—
2 350	5,641½	5·37	302·85	273	Repulse of Somerville	—
2 302	5,086½	5·78	293·97	273	Mercedes Sweet Duke of Glen Iris	—
2 270	7,350	3·96	290·97	273	Beleura Radio	—

PURE-BRED COWS COMPLETED

SENIOR TWO-YEAR-OLDS.—BUTTERFAT

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
Not allotted	Myrtle Bank Rambler	W. A. Rodda, Brooklyn Park	Jersey	15/6/31
28116	Burnlea Wattle 2nd	J. M. Hudd, Bletchley	"	—/7/31
28068	Tuela Freezia 2nd	F. Coleman, Saddleworth	"	23/7/31
31116	Cudlee Creek Lucy	W. A. Pool Cudlee Creek	"	23/6/31
Not allotted	Fernden Lady Madeira	E. O. Traeger, Eudunda	"	8/7/31
28076	Tuela Sparaxis	F. Coleman, Saddleworth	"	19/7/31
31142	Fernden Lady Columbine	E. O. Traeger, Eudunda	"	11/6/31
Not allotted	Tuela Diascea	F. Coleman, Saddleworth	"	7/9/31
28064	Tuela Aster	F. Coleman, Saddleworth	"	25/7/31
28109	Burnlea Bloom 2nd	J. M. Hudd, Bletchley	"	15/7/31
Not allotted	Myrtle Bank Edith	W. A. Rodda, Brooklyn Park	"	26/7/31
28059	Myrtle Bank Maglona 2nd	H. & A. Bohme, Balhannah	"	7/5/31
21598	Glenrobin Rumour	J. O. Robinson, Meadows	Ayrshire	25/8/31
31106	Hampden Mariposa's Lass	J. A. J. Pfitzner, Hampden	Jersey	4/3/32

JUNIOR THREE-YEAR-OLDS.—

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
Not allotted	Murray Glen Sylvia Topsy	C. J. Morris, Monteith	Friesian	11/6/31
24824	Sweet Haven Mercedes Bloom	J. M. Bray, Langhorne's Creek	Jersey	13/8/31
25036	Penrhyn Christobel 20th	W. S. McAuliffe, Eudunda	"	13/8/31
28066	Tuela Drosera	F. Coleman, Saddleworth	"	11/7/31
Not allotted	Mayflower 6th of Kiama	E. & A. Nicholls, Woodville	I.M.S.	31/7/31
"	Glenowie Plus Griselda 2nd	A. E. Middleton, Balaklava	Friesian	27/5/31
28135	Glen Ewin Morn's May	J. McEwin, Houghton	Jersey	23/8/31
24994	Hampden Dorothy	A. E. Middleton, Balaklava	"	21/8/31
28164	Morella Belle 4th	H. R. Walsh, Salisbury	"	26/9/31
24965	Pella Sweet Lotus	W. P. Eckermann, Eudunda	"	26/5/31
Not allotted	Ontario Kate 2nd	T. B. Brooks, Clarendon	"	3/9/31
24962	Pella Rose Marie	C. E. Verco, Mount Compass	"	21/7/31
28115	Burnlea Prudence	J. M. Hudd, Bletchley	"	—/9/31
24951	Crofton Sunshine	H. & A. Bohme, Balhannah	"	28/4/31
24990	Brinkworth Myra	C. C. T. Ottens, Brinkworth	"	21/7/31
Not allotted	Belmont's Flirt of Sunnybrook	J. J. Farrow, Gawler	M.S.	31/7/31
13104	Gentle 9th of Melross	Dunleith Pastoral Co., Ashbourne.	I.M.S.	9/4/31
21836	Kyby Madge 2nd	Government Farm, Kybybolite	Ayrshire	29/8/31
28074	Tuela Laurel 2nd	F. Coleman, Saddleworth	Jersey	17/7/31
13105	Millie 10th of Melross	Dunleith Pastoral Co., Ashbourne	I.M.S.	30/4/31
21831	Kyby Barbara 2nd	Government Farm, Kybybolite	Ayrshire	5/4/31
18311	Searchlight's Tot 2nd of Wangara	E. A. Groth, Walker's Flat	M.S.	28/7/31
25056	Roseworthy Sciential	Agricultural College, Roseworthy	Jersey	6/6/31
2125	Glenlea Fi Fi 2nd	E. T. Vinall, Brighton	Guernsey	3/9/31
25053	Roseworthy Princess 32nd	Agricultural College, Roseworthy	Jersey	1/5/31
18369	Royal's Sunflower of Northfield	Insp.-General Hospitals, Northfield	M.S.	3/8/31
21596	Glenrobin Nettie	J. O. Robinson, Meadows	Ayrshire	19/10/31
21837	Kyby Raida	Government Farm, Kybybolite	"	5/12/31
19417	Angle Farm Twinkle	Ayrbrook Farm Ltd., Aldgate	"	26/6/31
21843	Kyby Winsome	Government Farm, Kybybolite	"	11/9/31
21840	Kyby Rosebud 2nd	Government Farm, Kybybolite	"	17/11/31

SENIOR THREE-YEAR-OLDS.—

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
Not allotted	Murray Glen Princess Maggie	C. J. Morris, Monteith	Friesian	11/8/31
34326	Melvin Duchess	C. E. Verco, Mount Compass	Jersey	10/8/31
2656	Barina Rosemary Posch	L. H. and P. C. Giles, Auburn	Friesian	8/4/31
3001	Barina Woodcrest Maid	L. H. and P. C. Giles, Auburn	"	18/9/31
24865	Scrub View Daffodil	A. B. A. Weckert, Brinkworth	Jersey	1/7/31
28146	Hill Farm Bellona 2nd	E. W. Pfitzner, Eudunda	"	24/8/31
28065	Tuela Daffodil 2nd	F. Coleman, Saddleworth	"	7/7/31
24858	Wooroora Starbright's Doris	A. B. Sieber, Eudunda	"	5/6/31
28071	Tuela Heather	F. Coleman, Saddleworth	"	24/7/31
31117	Wompini Belle	W. A. Pool, Cudlee Creek	"	31/8/31
Not allotted	Bloomfield Alcartra Joan	W. Hawker, Clare	Friesian	10/6/31
24862	Fernden Lady Twylish	E. O. Traeger, Eudunda	Jersey	4/8/31
Not allotted	Murray Glen Inka Tulip 3rd	C. J. Morris, Monteith	Friesian	2/4/31
"	Longbeach Transvaal Star 9th	W. Hawker, Clare	"	20/8/31
"	Bloomfield Piebe's Nancy	W. Hawker, Clare	"	15/6/31
17798	Eldorado Snowflake	Ayrbrook Farm, Aldgate	Ayrshire	15/9/31
Not allotted	Ontario Kate's Twylish	T. B. Brooks, Clarendon	Jersey	24/5/31
18365	Limelight's Janet of Northfield	Insp.-Gen. Hospitals, Northfield	M.S.	25/5/31
24821	Pembroke Moss	Mrs. C. W. Ansell, Bletchley	Jersey	10/8/31
17884	Primrose of Toora	Insp.-Gen. Hosp., Northfield	M.S.	20/8/31

OFFICIAL TEST—*continued.*

Age at Calving.		Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Yrs.	Days.	Lbs.	%	Lbs.			
Standard, 250 lbs.—*continued.*							
2	186	5,181	5·61	290·52	273	Fawn Chief of Carrickalinga	—
2	11m.	4,917	5·76	283·44	273	Mack of Glenford	—
2	341	5,400	5·19	280·16	240	Tuela Eric	Dried off
2	304	6,279	4·42	277·38	273	Producer 3rd of Dalebank	—
2	256	5,389½	5·10	274·95	273	Werribee Combination	—
2	337	5,623½	4·66	262·13	273	Baron of Dalebank	—
2	222	3,745½	6·25	234·08	273	Kate's Chief of Myrtle Bank	—
2	217	4,614	5·07	234·07	273	Baron of Dalebank	—
2	363	4,191	5·31	222·34	273	Baron of Dalebank	—
2	327	4,125	5·25	216·59	210	Mack of Glenford	Dried off
2	297	4,056	5·12	207·54	273	Annette's Chief of Linden	—
2	246	3,654	5·61	205·05	273	Annette's Chief of Linden	—
2	248	4,945½	3·99	197·39	273	Oakbank Spotlight	—
2	238	1,740	6·36	110·61	90	Hampden Olive's King	Sold
Butterfat Standard, 270lbs.							
3	29	16,620	3·18	527·76	273	River Glen Lord Echo Griselda	—
3	79	8,476½	5·49	465·41	273	Mercedes Sweet Duke of Glen Iris	—
3	11	8,412	5·51	463·67	273	Makarini 2nd of Dalebank	—
3	87	7,740	5·96	461·63	273	Maid's Success of Linden	—
3	113	10,926	4·07	444·86	273	Viscount of East View	—
3	27	13,170	3·36	442·01	273	River Glen Sir Pietje Griselda	—
3	96	7,867½	5·24	412·31	273	Brucevale Lord Fancy Starbright	—
3	180	6,843	5·46	373·85	273	Beauty's King of Somerville	—
3	87	7,606½	4·90	372·59	273	Mercedes Sweet Duke of Glen Iris	—
3	144	6,945	5·24	363·86	273	Melford's King of Pella	—
3	26	6,391½	5·68	363·07	273	Cherry's Twylish of Para Wirra	—
3	182	6,255	5·80	362·93	273	Melford's Butter Lad of Pella	—
3	1m.	5,745	5·79	332·49	273	Mack of Glenford	—
3	115	6,295½	5·18	326·01	273	Butter King of Pella	—
3	148	5,653½	5·55	313·95	273	General Chris of Penrhyn	—
3	21	6,819	4·53	308·89	273	Jellicoe's Belmont of Sunnybrook	—
3	122	7,810½	3·83	298·88	273	Dainty's Triumph of Melross	—
3	65	7,495½	3·82	285·99	273	Loyalty of Bridge View	—
3	21	4,852½	5·89	285·72	273	Tuela Eric	—
3	106	7,136	3·92	279·99	273	Dainty's Triumph of Melross	—
3	37	6,996	3·88	271·70	273	Ida's Laird of Gowrie Park	—
3	86	6,154½	4·19	258·02	273	Searchlight of Darbalara	—
3	170	4,095	5·89	241·37	240	King Solomon of Dalebank	Dried off
3	147	4,177½	5·64	235·57	273	Glenlea Hilda's Valour 2nd	—
3	96	3,801	6·08	231·09	273	Courtier of Dalebank	—
3	109	5,376	4·79	211·22	273	Royal's Success of Arrawatta	—
3	10	4,455	4·07	181·14	210	Angas Boy	Dried off
3	106	3,375	4·47	150·98	180	Ida's Laird of Gowrie Park	Dried off
3	61	3,525	4·13	145·68	210	Angle Farm Liberty	Dried off
3	157	3,255	3·64	118·61	240	Loyalty of Bridge View	Dried off
3	94	3,165	3·50	110·86	120	Ida's Laird of Gowrie Park	Withdrawn
Butterfat Standard, 290lbs.							
3	288	13,573½	4·47	607·33	273	Glenburn Segis Griselda	—
3	301	10,021½	5·54	554·90	273	Retford Julian	—
3	318	15,444	3·23	499·36	273	River Glen Pietje Posch	—
3	251	13,413	3·67	491·72	273	River Glen Pietje Posch	—
3	306	8,317½	5·52	458·88	273	Holly's King of Hampden	—
3	228	7,108½	6·40	454·94	273	Oliver of Hampden	—
3	345	7,236	6·28	454·14	273	Maid's Success of Linden	—
3	333	7,953	5·67	451·01	273	Werribee Starbright's Fancy	—
3	364	8,247	5·04	415·68	273	Maid's Success of Linden	—
3	183	7,233	5·59	404·33	273	Werribee Masterman	—
3	218	12,462	3·13	390·27	273	Bloomfield Alcartra Clothilde	—
3	265	6,892½	5·35	368·59	273	Werribee Combination	—
3	293	10,117½	3·59	363·49	273	River Glen Lord Echo Griselda	—
3	358	8,370	4·23	354·20	240	Longbeach Transvaal Stamp	Dried off
3	248	9,636	3·59	345·77	273	Mutual Pearl Piebe	—
3	340	8,826	3·89	343·44	273	Perfection of The Valley	—
3	293	5,767½	5·87	338·40	273	Cherry's Twylish of Para Wirra	—
3	207	7,462½	4·46	333·09	273	Limelight of Darbalara	—
3	286	5,197½	5·41	281·23	273	Triumph 2nd of Dalebank	—
3	198	5,947½	4·47	265·76	273	Iris 5th's Superb of Toora	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
				SENIOR THREE-YEAR-OLDS.—
Not allotted	Anama Netherland Countess	W. Hawker, Clare	Friesian	30/7/31
18336	Gwen of East View	Dunleith Pastoral Co., Ashbourne	M.S.	16/7/31
28080	Tuela Waratah 2nd	F. Coleman, Saddleworth	Jersey	15/7/31
18327	Mayflower 5th of Kiama	E. & A. Nicholls, Woodville	M.S.	15/6/31
24998	Hampden Olive	J. A. J. Pfitzner, Hampden	Jersey	25/2/32
25057	Roseworthy Starlight	Agricultural College, Roseworthy	“	3/3/32
				JUNIOR FOUR-YEAR-OLDS.—
23570	Pella Reva Kelly	C. E. Verco, Mount Compass	Jersey	14/7/31
Not allotted	Glenowie Griselda Pontiac	H. Mountstephen, Monteith	Friesian	17/7/31
2654	Barina Posch's Easterdawn	L. H. & P. C. Giles, Auburn	“	21/8/31
2652	Barina Pietje's Gem	L. H. & P. C. Giles, Auburn	“	25/7/31
Not allotted	Glenowie Princess Patch	H. Mountstephen, Monteith	“	18/7/31
16387	Kyby Ina	Government Farm, Kybybolite	Ayrshire	12/6/31
24989	Oakhill Carnation 4th	Mrs. M. I. Neumann, Hampden	Jersey	24/8/31
Not allotted	Melvin May	C. E. Verco, Mount Compass	“	21/8/31
18422	Kyby Heather	Government Farm, Kybybolite	Ayrshire	13/9/31
24861	Fernden Lady Beth	E. O. Traeger, Eudunda	Jersey	13/8/31
18419	Kyby Airlie	Government Farm, Kybybolite	Ayrshire	18/8/31
24837	Burnlea Gloria	J. M. Hudd, Bletchley	Jersey	15/7/31
18426	Kyby Rarity	Government Farm, Kybybolite	Ayrshire	25/9/31
19491	Beleura Lobelia 2nd	A. J. Manoel, Birdwood	“	12/11/31
22714	El Rimal Rhoda	Ayrbrook Farm, Aldgate	“	2/7/31
18780	Oakbank Rosalind	J. O. Robinson, Meadows	“	6/11/31
24820	Pembroke Mona	Mrs. C. W. Ansell, Bletchley	Jersey	23/3/32
				SENIOR FOUR-YEAR-OLDS.—
24853	Hampden Maybee	J. A. J. Pfitzner, Hampden	Jersey	4/5/31
Not allotted	Glenowie Sylvia Patch	H. Mountstephen, Monteith	Friesian	4/6/31
24695	Para Wirra Cherry	J. H. Dawkins, Gawler	Jersey	25/5/31
24693	Pembroke Lotus	Mrs. C. W. Ansell, Bletchley	“	3/8/31
18326	Mayflower 4th of Kiama	E. & Nicholls, Woodville	M.S.	6/8/31
20772	Burnlea Bloom	J. M. Hudd, Bletchley	Jersey	5/7/31
23557	Dalebank Fairy Queen 3rd	A. J. Marrett, Saddleworth	“	15/4/31
23621	Roseworthy Princess 25th	Agricultural College, Roseworthy	“	30/7/31
15723	Beleura Princess	A. J. Manoel, Birdwood	Ayrshire	18/8/31
23617	Roseworthy Dawn	Agricultural College, Roseworthy	Jersey	23/7/31
18362	Ruby 5th of Hill View	A. Snell, Bolivar	M.S.	25/8/31
18356	Hero's Handsome 2nd of Illawarra	A. Snell, Bolivar	“	10/8/31
15726	Beleura Venus	A. J. Manoel, Birdwood	Ayrshire	18/9/31
15716	Beleura Hester	A. J. Manoel, Birdwood	“	23/9/31
10947	Posey of East View	Dunleith Pastoral Co., Ashbourne	I.M.S.	6/9/31
24822	Pembroke Neta	Mrs. C. W. Ansell, Bletchley	Jersey	11/9/31
23619	Roseworthy Lady 2nd	Agricultural College, Roseworthy	“	16/4/31
				MATURE COWS.—
1919	Murray Glen Sylvia Patch	C. J. Morris, Monteith	Friesian	4/6/31
2503	Murray Glen Segis Inka	C. J. Morris, Monteith	“	27/9/31
2501	Murray Glen Griselda's Olda	C. J. Morris, Monteith	“	31/1/31
17895	Countess Lotus of Pella	W. P. Eckermann, Eudunda	Jersey	4/5/31
23591	Woodside Morn	J. McEwin, Houghton	“	13/9/31
20738	Lupin of Tuela	E. W. Pfitzner, Eudunda	“	6/7/31
1850	Eastview Dorain Pauline	H. Mountstephen, Monteith	Friesian	27/9/31
2500	Murray Glen Echo Topsy	C. J. Morris, Monteith	“	8/7/31
1917	Murray Glen Inka Tulip	C. J. Morris, Monteith	“	4/8/31
1918	Murray Glen Princess Hauraki	C. J. Morris, Monteith	“	14/7/31
2463	Glenowie Plus Olda	H. Mountstephen, Monteith	“	28/8/31
20830	Winnie of Hampden	J. A. J. Pfitzner, Hampden	Jersey	30/5/31
20752	Millie 28th of Willow Farm	A. B. Weckert, Brinkworth	“	26/6/31
20827	Carnation of Hampden	J. A. J. Pfitzner, Hampden	“	1/7/31
2194	Glenowie Griselda Posch	H. Mountstephen, Monteith	Friesian	25/4/31
11656	Carnation of Oakhill	Mrs. M. I. Neumann, Hampden	Jersey	25/6/31
17896	Dora of Pella	A. B. Sieber, Eudunda	“	12/8/31
13245	Damsel of Brinkley	H. R. Walsh, Salisbury	“	6/6/31
20759	Bonnie Lotus of Pella	A. B. Sieber, Eudunda	“	1/6/31
19054	Burnlea Glory	J. M. Hudd, Bletchley	“	11/8/31
19049	Iris of Para Wirra	J. H. Dawkins, Gawler	Jersey	19/5/31
16805	Kate Kelly of Pella	W. P. Eckermann, Eudunda	“	1/6/31
12832	Anemone of Tuela	F. Coleman, Saddleworth	“	15/9/31
20760	Doreen of Pella	A. B. Sieber, Eudunda	“	22/7/31
2461	Glenowie Pauline Griselda	H. Mountstephen, Monteith	Friesian	—/7/31

OFFICIAL TEST—*continued.*

Age at Calving.	Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Yrs. Days.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 290LBS.—*continued.*						
3 329	6,975	3·26	227·73	150	Longbeach Netherland King 2nd	Temp. exemptn.
3 340	5,619	3·92	220·14	273	Mariner of Greyleigh	—
3 321	4,332	4·97	215·40	273	Milklad 9th of Dalebank	—
3 205	5,815½	3·59	208·61	273	Viscount of East View	—
3 211	3,585	5·53	198·33	120	Repulse of Somerville...............	Sold
3 250	435	5·62	24·45	30	Roseworthy Twylish................	Temp. exemptn.
BUTTERFAT STANDARD, 310LBS.						
4 143	10,633	5·66	602·14	273	Werribee Starbright's Fancy.........	—
4 162	13,057½	3·70	483·74	273	River Glen Sir Pietje Griselda	—
4 126	14,781	2·88	426·27	273	River Glen Pietje Posch	—
4 79	14,413½	2·87	413·37	273	River Glen Pietje Posch	—
4 69	11,962½	3·39	405·46	273	Murray Glen Echo Griselda..........	—
4 162	8,698½	4·29	373·59	273	Loyalty of Bridge View	—
4 141	6,025½	5·69	342·60	273	Milklad 2nd of Dalebank	—
4 6	6,540	5·17	338·07	240	Retford Julian	Sold
4 70	8,137½	3·82	311·23	240	Loyalty of Bridge View	Dried off
4 167	6,376½	4·72	300·74	273	Werribee Combination	—
4 179	6,495	4·54	295·13	240	Ida's Laird of Gowrie Park	Dried off
4 75	5,058	5·64	285·30	273	Mack of Glenford	—
4 25	7,153½	3·82	273·49	273	Ida's Laird of Gowrie Park	—
4 108	4,845	3·74	181·33	210	Starlight of Beleura	Dried off
4 136	3,675	4·25	156·31	210	El Rimal Prince Charlie.............	Dried off
4 15	2,925	4·28	125·33	90	Oakbank Spotlight	Withdrawn
4 146	1,725	5·61	96·69	90	Triumph 2nd of Dalebank	Sold
BUTTERFAT STANDARD, 330LBS.						
4 319	7,798½	6·10	475·75	273	Carnation Lad of Dalebank..........	—
4 226	11,584½	4·07	471·69	273	River Glen Sir Pietje Griselda	—
4 286	7,531½	5·67	427·31	273	Twylish of Para Wirra	—
4 306	7,563	5·26	397·76	273	Triumph 2nd of Dalebank	—
4 304	9,843	3·45	339·32	273	Pembroke of Greyleigh.............	—
4 360	6,297	5·37	337·85	273	Mack of Glenford	—
4 276	6,991½	4·72	329·95	273	Baxter of Banyule	—
4 277	6,417	4·76	305·70	273	King Solomon of Dalebank	—
4 319	7,884	3·87	304·95	273	Starlight of Beleura	—
4 197	5,761½	5·25	302·34	273	Lad of Linden	—
4 214	7,599	3·77	286·33	273	Gay Lad of Burradale	—
4 339	6,439½	4·40	283·42	273	Fussy's Hero of Hill View	—
4 354	7,422	3·75	278·03	273	Starlight of Beleura	—
4 360	8,248½	3·10	255·83	273	Starlight of Beleura	—
4 329	7.332	3·39	248·45	273	Belmont of Darbalara	—
4 281	4,545	5·29	240·37	240	Triumph 2nd of Dalebank	Dried off
4 234	4,170	5·07	211·40	273	Courtier of Dalebank	—
BUTTERFAT STANDARD, 350LBS.						
7 16	{ 17,014½	4·26	724·89	273 }	Burnbank Sylvia Patch	—
	{ 20,350	4·40	895·29	365 }		
5 128	15,366	4·59	704·94	273	Glenburn Segis Griselda	—
5 8	{ 16,855½	3·69	621·93	273 }	River Glen Lord Echo Griselda	—
	{ 19,192½	3·75	719·53	365 }		
6 351	9,846	6·27	617·49	273	Werribee Starbright's Fancy	—
5 357	11,091	5·23	580·50	273	Montrose Sultan (Imp.)	—
6 349	9,705	5·90	572·52	273	Maid's Success of Linden	—
7 197	12,760½	4·43	565·14	273	St. Alban's Helen's Woodcrest Paul .	—
5 4	14,730	3·80	559·74	273	River Glen Lord Echo Griselda	—
7 19	12,408	4·50	558·48	273	River Glen Lord Echo Griselda	—
7 280	14,587½	3·69	538·73	273	Woorak of Henley	—
6 58	17,392	3·01	524·19	273	Henley Plus Colantha	—
5 91	7,882½	6·52	513·68	273	Beauty's King of Somerville	—
6 297	10,110	4·99	504·55	273	Molly 5th's Audrey Twylish of Banyule	—
5 79	8,826	5·68	501·71	273	Carnation's Lad of Dalebank........	—
6 168	16,503	3·01	496·15	273	River Glen Sir Pietje Griselda	—
9 308	{ 7,984½	6·18	493·55	273 }	Janet's Laddie of Grantala	—
	{ 9,942½	6·12	608·95	365 }		
7 98	8,362½	5·89	492·39	273	Werribee Starbright's Fancy	—
10 256	11,107½	4·32	479·33	273	Molar Chief of Banyule	—
5 60	9,070½	5·26	477·07	273	Werribee Starbright's Fancy	—
6 118	8,763	5·40	472·80	273	Triumph 2nd of Dalebank	—
6 8	10,237½	4·54	464·53	273	Molly 5th's Audrey Twylish of Banyule	—
7 141	7,896	5·81	458·97	273	Werribee Starbright's Fancy	—
11 37	8,913	5·08	453·04	273	Pat of Dalebank	—
5 28	9,126	4·93	449·71	273	Governor Grey of Pella	—
5 4m.	10,420½	4·31	449·33	273	River Glen Sir Pietje Griselda	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
		MATURE COWS.—BUTTERFAT		
28161	Pella Solanum Micaela	C. E. Verco, Mount Compass	Jersey	5/8/31
23605	Hampden Rhonda	C. C. T. Ottens, Brinkworth	"	22/7/31
20825	Judith of Talunga	C. C. T. Ottens, Brinkworth	"	6/8/31
19058	Columbine's June of Glen Ewin	Jas. McEwin, Houghton	"	10/7/31
1916	Murray Glen Griselda's Topsy	C. J. Morris, Monteith	Friesian	12/8/31
19075	Pearl of Hampden	J. A. J. Pfitzner, Hampden	Jersey	12/8/31
23554	Myrtle Bank Kate	T. B. Brooks, Clarendon	"	17/6/31
8922	Jane of Koorali	J. A. J. Pfitzner, Hampden	"	8/8/31
17891	Pearl of Dalebank	A. Schulze, Paradise	"	13/8/31
12843	Mariposa of Hampden	J. A. J. Pfitzner, Hampden	"	8/7/31
14622	Azalea of Tuela	F. Coleman, Saddleworth	"	29/7/31
16806	Solanum's Blossom of Pella	W. P. Eckermann, Eudunda	"	15/5/31
28072	Tuela Hibiscus	F. Coleman, Saddleworth	"	28/7/31
20740	Sweetbriar of Tuela	F. Coleman, Saddleworth	"	20/8/31
15074	Lotus of Oakhill	Mrs. M. I. Neumann, Hampden	"	20/7/31
17889	Jean 3rd of Dalebank	Mrs. C. W. Ansell, Bletchley	"	8/7/31
10922	Buttercup Jellicoe 2nd of Illawarra	A. Snell, Bolivar	I.M.S.	29/7/31
12842	King's Violet of Hampden	C. E. Verco, Mount Compass	Jersey	26/10/31
10590	Princess 3rd of Willow Farm	A. J. Marrett, Saddleworth	"	18/7/31
16394	Kyby Snowbell	Government Farm, Kybybolite	Ayrshire	15/4/31
14238	Beleura Primrose 2nd	A. J. Manoel, Birdwood	"	1/8/31
17925	Roseworthy Sunlight	Agricultural College, Roseworthy	Jersey	17/4/31
24692	Pembroke Duchess	Mrs. C. W. Ansell, Bletchley	"	26/8/31
20847	Roseworthy Flora	Agricultural College, Roseworthy	"	6/8/31
2942	Totara Veeman Pauline	W. Hawker, Clare	Friesian	23/9/31
2350	Barina Coolangatta Buttercup	L. H. and P. C. Giles, Auburn	"	6/4/31
20729	Kate 4th of Stoneyfell	H. and A. Bohme, Balhannah	Jersey	9/7/31
10923	Molly Jellicoe of Illawarra	A. Snell, Bolivar	I.M.S.	31/7/31
11653	Gayboy's Sunflower of Wangara	Insp.-Gen. Hospitals, Northfield	M.S.	9/9/31
13851	Viola 2nd of Dalebank	Mrs. C. W. Ansell, Bletchley	Jersey	27/8/31
23590	Woodside Coutance's Peeress 2nd	J. McEwin, Houghton	"	1/9/31
19079	Roseworthy Princess 18th	Agricultural College, Roseworthy	"	5/9/31
23638	Kelvinside Trilby Olive	H. R. Walsh, Salisbury	"	16/9/31
14625	Syringa of Tuela	F. Coleman, Saddleworth	"	31/7/31
12839	Sumach of Tuela	F. Coleman, Saddleworth	"	22/7/31
14704	Kyby Barbara	Government Farm, Kybybolite	Ayrshire	26/6/31
17883	Pembroke Viola	Mrs. C. W. Ansell, Bletchley	Jersey	4/9/31
13415	Kyby Rose 2nd	Government Farm, Kybybolite	Ayrshire	4/6/31
17929	Lady Alice of Fernden	E. O. Traeger, Eudunda	Jersey	16/8/31
28069	Tuela Fuchsia	F. Coleman, Saddleworth	"	13/9/31
16844	Maglona 5th of Willow Farm	W. A. Rodda, Brooklyn Park	"	6/9/31
17919	Pimpernel 4th of Oakhill	Mrs. M. I. Neumann, Hampden	"	5/5/31
16845	Roseworthy Lady	Agricultural College, Roseworthy	"	29/6/31
15036	Sunflower of Ben Lomond	Insp.-Gen. of Hospitals, Northfield	M.S.	9/5/31
17913	Lady Merden of Eudunda	W. S. McAuliffe, Eudunda	Jersey	7/8/31
13870	Joffre's Boronia of Wangara	J. J. Farrow, Gawler	M.S.	13/6/31
1362	Evandale Dixie	E. T. Vinall, Brighton	Guernsey	16/5/31
20755	Millie 30th of Willow Farm	T. B. Brooks, Clarendon	Jersey	9/8/31
15037	Tot 2nd of Ben Lomond	Insp.-Gen. Hospitals, Northfield	M.S.	22/9/31
14623	Tuela Diosma	F. Coleman, Saddleworth	Jersey	13/8/31
Not allotted	Eudunda Pearl	Mrs. A. M. Carruthers, Narrung	"	6/8/31
15301	Oakbank Regard	J. O. Robinson, Meadows	Ayrshire	14/10/31
20746	Viola 3rd of Dalebank	H. R. Walsh, Salisbury	Jersey	5/8/31
19052	Burnlea Blandina	J. M. Hudd, Bletchley	"	-/9/31
15035	Princess 3rd of Ben Lomond	Insp.-Gen. Hospitals, Northfield	M.S.	21/10/31
15665	Angle Farm Poppy	Ayrbrook Farm Ltd., Aldgate	Ayrshire	3/9/31
15184	Oakbank Alleyne	Government Farm, Kybybolite	"	12/11/31
15666	Angle Farm Primrose	Ayrbrook Farm Ltd., Aldgate	"	14/1/23

WARTS ON UDDERS OF COWS.

Replying to the Secretary, Agricultural Bureau, Wepowie, who asked: ''What is the cause of and a cure for warts on a milch cow's udder?'' Mr. C. McKenna, B.V.Sc. (Government Veterinary Officer) says warts in cattle have been shown to be infectious. The cause is a germ. Rubbing is supposed to be the common method of spread. Warts may occasionally disappear without treatment of any kind. Most cases require treatment as follows:—(1) Warts which are small at base may be clipped off and resultant wound dressed with tr. iodine, or else they may be removed by tying a thread around them (recommended for large size warts with small base). (2) Painting daily with tr. iodine or glacial acetic acid. (Before applying latter, apply vaseline to surrounding healthy skin.) (3) Small warts as on udders of cows can be dressed daily with warm castor oil. (4) Further, in young stock (6-12 months old) give one tablespoonful of Fowler's solution of arsenic night and morning in a small damped feed. Note.—Do not give arsenic solution to milking cows, as the arsenic may pass into the milk.

OFFICIAL TEST—*continued.*

Age at Calving.		Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Yrs.	Days.	Lbs.	%	Lbs.			
STANEARD, 350LBS.—*continued.*							
5	119	6,772½	6·50	440·49	273	Werribee Starbright's Fancy	—
5	48	8,511	5·18	440·47	273	Carnation's Lad of Dalebank	—
6	277	8,889	4·89	434·54	273	Molar Chief of Banyule	—
6	39	7,132½	6·03	430·25	273	Trixie's Lad of Glen Ewin	—
7	72	12,796½	3·35	428·42	273	River Glen Lord Echo Griselda	—
6	32	7,977	5·35	426·42	273	Carnation's Lad of Dalebank	—
5	270	7,365	5·76	424·37	273	Cheverell of Banyule	—
11	9	8,173½	5·11	417·31	273	Menelaus of Kiama	—
6	270	7,063½	5·90	416·78	273	Duke of Dalebank	—
9	87	7,219½	5·72	413·07	273	Retford Oaklands	—
8	329	9,169½	4·48	410·65	273	Admiral 2nd of Dalebank	—
7	65	7,177½	7·68	407·38	273	Werribee Starbright's Fancy	—
5	48	6,669	6·11	407·30	273	Maid's Success of Linden	—
6	141	8,802	4·59	403·85	273	Maid's Success of Linden	—
10	149	6,988½	5·75	401·67	273	Lord Douglas of Penrhyn	—
6	224	8,085	4·95	399·89	273	Baxter of Bayule	—
6	135	9,621	4·15	399·21	273	Fussy's Jellicoe of Hill View	—
9	138	7,935	4·91	389·96	210	Beauty's King of Somerville	Sold
11	228	7,776	5·02	389·93	273	Lord Silvermine 9th of Banyule	—
5	35	8,857½	4·40	389·51	273	Loyalty of Bridge View	—
6	275	10,021½	3·88	388·93	273	Model of Beleura	—
6	274	7,392	5·24	387·17	273	Trick of Linden	—
5	47	6,745½	5·65	381·37	273	Triumph 2nd of Dalebank	—
5	300	6,706½	5·64	378·28	273	King Solomon of Dalebank	—
5	48	11,280	3·34	377·19	273	Veeman Pontiac Prince	—
5	238	11,955	3·12	373·53	273	Pride's King Rock of Brundee	—
5	64	6,810	5·48	373·33	273	Bonnie Chief of Inglewood	—
5	328	8,442	4·41	372·34	273	Fussy's Jellicoe of Hill View	—
11	247	9,754½	3·78	368·77	273	Gayboy of Arrawatta	—
8	248	6,235½	5·90	367·82	273	You'll Do of Dalebank	—
5	78	6,954	5·23	363·83	273	Speedwell's Volunteer (imp.)	—
6	154	6,346½	5·73	363·51	273	Trick of Linden	—
5	250	6,675	5·34	356·45	273	Noble of Yaralla	—
8	354	7,860	4·50	353·73	240	Admiral 2nd of Dalebank	Dried off
9	321	6,693	5·27	352·46	273	Pat of Dalebank	—
5	241	8,311½	4·15	344·91	273	Loyalty of Bridge View	—
6	299	5,929½	5·75	340·69	273	Twylish of Dalebank	—
7	22	7,726½	4·30	332·39	273	Loyalty of Bridge View	—
6	307	7,041	4·69	330·11	273	Milklad 5th of Dalebank	—
5	77	6,225	5·14	319·82	240	Maid's Success of Linden	Dried off
8	352	5,964	5·35	319·23	273	Silvermine of Willow Farm	
6	227	4,885½	6·52	318·36	273	Grey Sprite of Linden	—
7	57	7,362	4·31	317·47	273	King Solomon of Dalebank	—
5	265	7,710	3·88	299·18	240	Conjuror of Darbalara	Dried off
6	277	4,890	6·10	298·09	240	Escamillo of Pella	Dried off
9	319	7,620	3·87	294·88	240	Joffre of Wangara	Dried off
7	28	5,065½	5·79	293·23	273	Milton Dictator	—
6	5	5,497½	5·28	290·37	240	Molly 5th's Audrey Twylish of Banyule	Dried off
5	34	7,465½	3·77	281·38	273	Conjuror of Darbalara	—
9	9	6,496½	4·27	277·12	273	Admiral 2nd of Dalebank	—
5	59	5,983½	4·44	265·44	273	Statesman 3rd of Linden	—
11	346	6,465	4·10	265·31	240	Loudon of Oakbank	Dried off
5	206	5,505	4·68	257·88	273	Baxter of Banyule	—
6	10ms.	4,618½	5·35	246·96	273	Triumph 2nd of Dalebank	—
5	71	4,425	4·79	211·92	90	Conjuror of Darbalara	Withdrawn
6	63	4,185	4·35	181·97	150	Angle Farm Liberty	Dried off
7	337	2,955	3·57	105·59	180	Bright's Jock of Oakbank	Dried off
5	114	660	3·63	23·93	30	Angle Farm Liberty	Withdrawn

DORSET HORN RAM AS A SIRE FOR LAMBS.

Reporting that a fairly high percentage of Merino ewes mated with the Dorset Horn ram had considerable difficulty in lambing, the Secretary of the Yadnarie Branch of the Agricultural Bureau asks if ewes crossed with the Border Leicester ram would have the same trouble. The Supervisor of Experimental Work (Mr. R. C. Scott) says that lambs by Dorset Horn rams are frequently particularly broad and deep in the chest, and if the ewes are young or small framed, lambing difficulties are increased. There is always a certain amount of trouble when Merino ewes are mated with Dorset Horn rams, but the larger the frame of the mother, the smaller the percentage of ewes which have to be assisted at lambing time.

The Border Leicester is somewhat differently shaped, and with his pointed face provides for a wedge-shaped presentation and, therefore, easier birth. The Southdown ram is smaller framed and, except in the case of accident, his progeny are born freely. This sire would give lambs of the best export type and less lambing difficulties would be anticipated. If either this breed or the Border Leicester were mated with Merino ewes.

PRUNING COMPETITIONS.

LOWER NORTH.

CHAMPIONSHIP COMPETITIONS.

The Championship events of the 1932 series of Pruning Competitions for the Lower North were held at Light's Pass on July 13, when there were 18 competitors in the Fruit Tree section and 25 in the Vine section. The sites chosen were Messrs. F. W. Boehm's and Bert Boehm's orchards for Fruit Trees and Mr. A. Moder's vineyard for the Vines. The Branches represented by the competitors were Angaston, Koonunga, Light's Pass, Lone Pine, Lyndoch, Penwortham, Watervale, and Williamstown. Among the competitors was Mr. Fred Boehm, the 14-year-old son of Mr. F. W. Boehm. This young man received the congratulations of competitors and visitors on his success in gaining a place in the Light's Pass local competitions, which entitled him to compete in the championship. Dr. J. Davidson and Mr. J. W. Evans, of the Waite Agricultural Research Institute, were present, and Messrs. Geo. Quinn (Chief Horticultural Instructor), H. C. Pritchard (General Secretary of the Agricultural Bureau), J. B. Harris (District Horticultural Instructor), and J. L. Williams (Viticultural Instructor, Roseworthy College) represented the Department of Agriculture.

The Lower North district covers a large area, and the Competitions entail a lot of detail work in their administration. The efforts of Branch Secretaries and Committees are therefore appreciated by those who are in any way associated with these Competitions. The competent and energetic work of the Competition Secretary (Mr. J. S. Hammat) brought the championship events to a successful termination, and he was ably assisted by Mr. L. A. Koop, of Light's Pass.

During the luncheon adjournment Dr. Davidson gave an interesting discourse on "Thrips."

TROPHIES.

At a meeting at Nuriootpa on July 29th, at which the Chairman of the Light's Pass Branch (Mr. A. Milway) presided over a large attendance, Dr. A. R. Callaghan (Principal of the Roseworthy Agricultural College) presented the trophies donated by the Royal Agricultural and Horticultural Society to the winners (Messrs. F. W. Boehm and H. Hammerling) in the Fruit Tree and Vine sections respectively. Mr. W. Langdon Parsons exhibited a cup for competition over a period of three years ending in 1933, and he also intimated that a similar trophy would be available for another three-year period commencing with the 1934 Competitions.

FRUIT TREE SECTION.

Judges—Messrs. G. Quinn (Chief Horticultural Instructor) and J. B. Harris (District Horticultural Instructor).

	Apple.	Pear.	Peach.	Apricot.	Total.
F. W. Boehm	92½	90	90	88	360½
H. Linton	90	91	85	89	355
J. B. Helbig	93½	85½	85½	90	354½
A. Andriske	92½	82	89½	87	351
Fred. Boehm	85½	82½	94	86	348
A. S. Burgess	92	87	84	85	348
W. Codrington	89½	89	87½	81	347
D. J. Bain	87	91	82	86	346
F. L. Burgess	87½	86	84½	88	346
B. Fromm	86	82½	89	85	342½
H. D. Bain	87½	89	81	84½	342
V. M. Duke	87	87½	88	78	340½
C. A. Hoffmann	86½	78½	82	89	336
R. Burgess	87	85	80	83	335
Wilf. Smith	89	86	76	81	332
E. W. Burgess	82	85½	81½	80	329
W. H. Penna	73	82	90	82	327
C. G. Fromm	80	74	87½	83½	325

VINE SECTION.

Judges—Messrs. C. A. Pollitt and J. L. Williams (Viticultural Instructor, Roseworthy Agricultural College).

Competitor.	Spur.	Rod.	Total.
H. Hammerling	90	94	184
C. R. Helbig	87	95	182
G. Otto	84	96	180
G. Boehm	90	89	179
H. Linton	89	89½	178½
J. B. Helbig	91	87½	178½
A. F. Leske	90	87½	177½
F. Linton	90½	85	175½
Wilf. Smith	86	89	175
E. B. Filsell	86½	88½	175
O. B. Kurtz	86	89	175
R. Gallasch	90	84	174
G. Merritt	85	88	173
A. Sparrow	86	86½	172½
E. Schiller	88	84	172
A. Hage	88	84	172
A. E. Helbig	84	88	172
A. S. Burgess	83½	87	170½
F. W. Boehm	90	80	170
A. Andriske	89	80	169
V. M. Duke	83½	85	168½
A. Graetz	82	85	167
A. L. Wayman	84	79	163
A. Smith	82	80	162
C. S. Wyman	82	77½	159½

ROSEWORTHY AGRICULTURAL COLLEGE.

LIVESTOCK FOR SALE.

During the next few weeks the College can offer for sale the following animals from their well-known flocks:—

Berkshire Boars, from 8 weeks to 8 months old.
Berkshire Sows, from 8 weeks to 16 weeks old.
Berkshire-Tamworth Crossbred Sows.
Jersey Bulls and Bull-calves, from Tested Herd-book Cows.
Southdown Rams—Hoggets to 6-tooth.
White Indian Runner Drakes and Ducks.
White Leghorn Roosters.
Black Orpington Roosters.

— FULL PARTICULARS FROM THE PRINCIPAL. —

McLAREN FLAT.

The Annual Pruning Competitions, conducted under the auspices of the McLaren Flat Branch of the Agricultural Bureau, were held in the vineyard of Mr. J. Ingoldby on July 16th. The judges were Messrs J. B. Harris (District Horticultural Instructor) and J. L. Williams, rod section, and Messrs. G. Cox and E. Leishman (District Horticultural Instructor, spur section. Mr. H. C. Pritchard (General Secretary Agricultural Bureau) attended on behalf of the Advisory Board of Agriculture. Secretarial duties were in the capable hands of Mr. P. T. Wait, who is to be congratulated on the excellent manner in which the competitions were organised.

Name.	Spur.	Rod.	Total.
E. Strout	95	87	182
L. V. Turner	89½	91	180½
T. E. Teusner	81½	95	176½
H. J. Cox	90	82	172
F. H. Schurgott	89½	84	173½
A. H. King	88	89	177
E. Waye	79	83	162
C. Sparrow	80	80	160
A. Lush	85½	84	169½
M. Robertson	83½	78	161½
D. Hunt	86	—	86
R. J. Deane	82½	85	167½
P. S. Roe	79½	75	154½
F. Price	87½	85	172½
W. Harris	86	89	175
W. Delaney	83	81	164
J. Piercy	93½	70	163½
L. Stamfield	79	80	159
K. T. Whiting	85½	88	173½
M. Perkins	82	81	163
J. Sigston	85	82	167
A. W. Osmond	83	82	165
L. G. Osmond	82	70	152
T. Burgan	83	82	165
Reg. Elliott	85	86	171
K. Broughton	78	88	166
C. Sigston	88	74	162
A. G. Air	87	89	176
E. E. Air	87½	81	168½
E. J. Air	81	72	153
G. Hobbs	78	81	159
R. Low	83	82	165
F. M. Elliott	87	83	170
B. Powell	80	93	173
A. Cooper	81	84	165
L. Ward	83	83	166
S. Bennett	80½	92	172½
W. Sigston	82½	70	152½
G. Dowdell	88	90	178
R. Townsend	88½	84	172½
P. Penney	86	87	173
H. Hobbs	85½	79	164½
L. Hobbs	82	72	154
C. Penney	80	76	156
S. Ledgard	80	83	163

Mr. E. Strout won the cup presented by the Royal Agricultural and Horticultural Society for the highest aggregate in both sections.

TREE SECTION.

Judge—R. Fowler.

Name.	Apricot.	Prune.	Total.
F. M. Elliott	81	83	164
S. Ledgard	84	77	161
Reg. Elliott	82	80	162
D. Nicolle	81	79	160
L. Ward	80	82	162

SENIOR BOYS.

Competitor.	Spur.	Rod.	Total.	Competitor.	Spur.	Rod.	Total.
C. E. Air	67	72	139	E. Harris	66	63	129
A. Powell	71	65	136	C. Bruce	62	64	126
R. Townsend	69	67	136	R. Mills	63	62	125
W. Osmond	68	67	135	R. Raynor	60	65	125
H. Sparrow	65	69	134	A. Lush	62	63	125
D. Hunt	64	68	132	R. Hobbs	61	59	120
C. Penney	67	64	131				

BOYS 12-15 YEARS.

SPUR PRUNING.

Competitor.	Points.	Competitor.	Points.
S. Penney	78	D. Bagshaw	64
R. Gross	76	S. Perry	64
C. Oakley	76	J. Gregory	62
R. Deane	74	D. Broughton	62
R. Ward	72	C. McMurtrie	62
G. Townsend	72	T. Perry	56
R. Ellis	70	J. Fuller	54
J. Deane	67	R. Potter	54
E. Penney	67	W. Stanfield	52
F. Ellis	65	F. Poole	44
C. Klinger	64		

BOYS 12-15 YEARS.

ROD PRUNING.

Competitor.	Points.	Competitor.	Points.
R. Ellis	72	R. Ward	57
E. Penney	62	F. Ellis	51
G. Townsend	60	W. Stanfield	47
D. Broughton	60		

BOYS UNDER 12 YEARS.

SPUR PRUNING.

Competitor.	Points.	Competitor.	Points.
J. Dowdell	72	K. Hobbs	67
R. Elliott	70	B. Werman	60
D. Elliott	69	F. Rau	59
H. Ward	69	H. Stockley	55
J. Warren	67		

TWIN LAMB DISEASE.

REPORT OF EXPERIMENTAL WORK AT AGRICULTURAL COLLEGE, ROSEWORTHY.

[By A. R. Hickinbotham, B.Sc., Dip.Ed., Chemist, and W. G. Bennett, B.V.Sc., Veterinarian.]

Introductory.

In a previous paper (*Journal* of the Department of Agriculture, South Australia, July, 1931) an account was given of experimental work conducted at the College in connection with soursob poisoning. Attention was directed to similarities in symptoms of soursob poisoning and twin lamb (or twin pregnancy) disease, and the hypothesis was put forward that twin lamb disease was also associated with a lowering of the calcium content of the blood.

This, in turn, suggested the possibility of treating twin lamb disease with calcium. Certain experiments were carried out, as reported, with encouraging results.

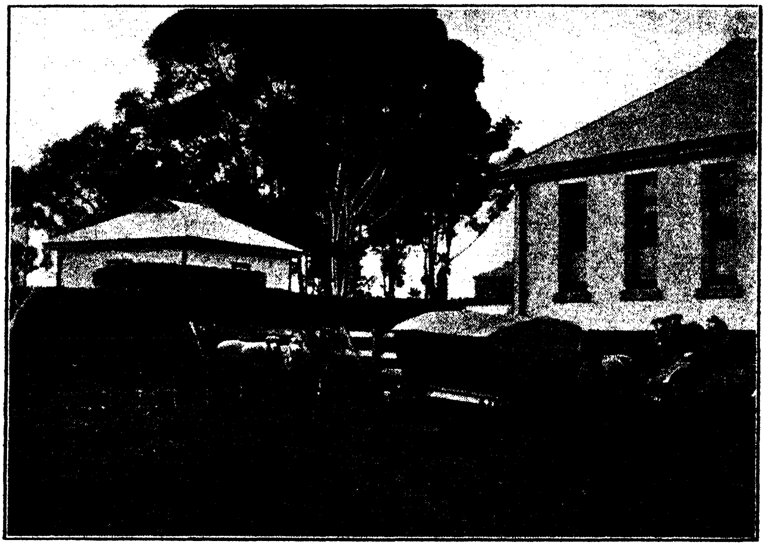


Fig. 1.—The experimental yards showing limited space and method of feeding.

Experiment, 1932.

Another experiment to test this hypothesis was planned this year, but owing to circumstances beyond control the start was made too late in the season for any measure of finality to be reached. Further, the season has been so favorable that no normal twin lamb disease cases have been reported here. At the same time, certain data obtained from the experiment may be of interest.

Forty flock ewes—all Border Leicester-Merino crossbreds excepting two Merinos—were placed in special yards and 30 were fed dry feed and exercise was limited, with the object of producing twin lamb disease, the experimental ration being, at first, cocky chaff; later, mixed straw chaff. The remaining 10 were on green feed as a control.

The only ewes available were, unfortunately, in excellent condition and close to lambing. All were subjected to a preliminary period of 14 days on dry feed, and during this period 19 lambed. They were then divided for separate treatment, but further lambing reduced the numbers rapidly.

RESULTS.

Only one death occurred, the ewe dying overnight. It was apparently normal late in the afternoon; late in the evening it was observed to be showing symptoms similar to those of twin lamb disease. Early next morning it was dead, and showed *post-mortem* changes consistent with this disease. No treatment was given in this case, which occurred in the third week.

After four weeks, calcium determinations were made on the blood of a ewe of each group, and these showed 9.2 mgms. per 100 ccs. for dry feed only, and 10.2 mgms. for dry feed with supplements (bone meal and vitamins).

After six weeks on dry feed another ewe showed symptoms which appeared to indicate the onset of twin lamb disease, but within 12 hours it had lambed. A blood sample taken gave 8.6 mgms, of calcium.

Only three ewes, which proved to be empty, now remained—two Merinos and a crossbred. These were carried on for a total period of 2½ months in an effort to show the effect, if any, of these conditions (dry feed and lack of exercise) on the calcium content of the blood. At the end of the test the Merinos gave 10.1 and 9.3 mgms., but the crossbred gave only 7.95 mgms., and its general condition was very low (Fig. 2).

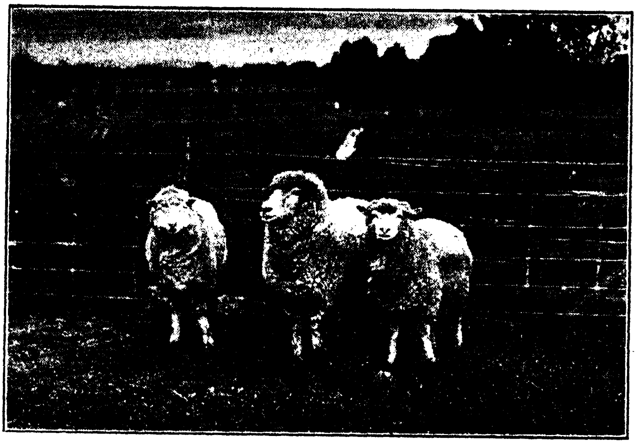


Fig. 2.—**Showing the effect on the last two crossbred ewes of 2 months on dry feed and confined space, compared with a ewe (centre) from the same flock on natural pasture continuously.**

The crossbred was turned out on to natural pasture, and three weeks later its blood calcium had risen to 9.75 mgms. Two similar crossbred ewes that had been on natural pasture continuously were tested at the same time and gave 10.8 and 11.3 mgms.

CONCLUSIONS.

While, owing to the limited number of cases examined, these results scarcely prove anything, they are, at least, not contrary to the hypothesis, and are sufficient to justify further experimental work next year.

The results suggest that prolonged dry feeding of this type and lack of exercise tend to lower the calcium content of the blood, even in empty ewes which do not have to meet the calcium requirements of a foetus. The same conditions are known to favor the occurrence of twin lamb disease.

It will be noticed that the two Merinos stood up to the conditions better than the one remaining crossbred.

ACKNOWLEDGMENTS.

We are indebted to Messrs. W. J. Spafford, Acting Principal, for interest and assistance; S. E. Whicker for general care of the sheep; and J. P. Egan.

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JUNE, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow October to June.	Per Herd during June.	Per Cow during June.	Per Cow October to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C....	34	22·33	17,257½	507·57	4,605·24	863·88	25·41	234·88	5·01
5/D ...	27·53	17·73	14,117	512·78	4,327·42	770·60	27·99	228·01	5·46
5/E ...	44·90	33·17	21,207½	472·33	4,032·39	1,175·29	26·18	212·82	5·54
5/L ...	18·83	18·43	18,783	998·69	4,861·19	909·92	48·39	240·25	4·83
5/R ...	57·67	41·37	15,576½	270·10	3,081·89	654·83	11·35	130·26	4·20
5/S ...	22	17·80	6,763	307·41	3,448·15	364·96	16·59	179·81	5·40
5/U ...	26·87	18·83	16,734½	622·79	6,941·93	762·18	28·37	298·69	4·55
5/Y ...	24·13	20·03	12,847	532·41	5,499·32	712·26	29·52	291·54	5·54
5/Aa ..	16·97	13·10	4,483½	264·20	3,471·92	265·60	15·65	185·45	5·92
5/Dd .	20·93	17·07	9,568	457·14	4,693·71	568·39	27·16	264·16	5·94
5/Ee ..	16·73	2·17	1,373	82·07	5,027·82	74·62	4·46	265·43	5·43
5/Ii ...	26	19·47	12,790½	491·94	4,902·88	638·85	24·57	236·74	4·99
5/Jj ..	30·33	13·33	12,325	406·36	4,033·40	550·12	18·14	178·41	4·46
5/Kk .	19	18	9,480	498·95	4,905·34	493·32	25·96	237·43	5·20
5/Mm .	16	11·83	6,485	405·31	3,959·01	354·15	22·13	199·08	5·46
5/Nn .	27·10	17·63	10,499	387·42	4,536·87	533·91	19·70	214·19	5·09
5/Oo ..	22	16·10	6,297	286·23	4,261·77	331·05	15·05	198·17	5·26
5/Pp ..	31	25·27	18,509½	597·08	3,835·70	880·84	28·41	188·49	4·76
5/Qq ..	16	13·97	6,924	432·75	3,855·39	378·91	23·68	202·53	5·47
					Dec.-June			Dec.-June.	
5/Rr ..	21·57	20	13,585	629·81	2,622·26	770·82	35·74	141·34	5·67
5/Ss ..	14	8·43	4,195	299·64	2,831·45	216·71	15·48	136·06	5·17
Means .	25·41	18·38	11,419·07	449·43	4,303·50	584·34	23·00	212·18	5·12

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JUNE, 932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow July to June.	Per Herd during June.	Per Cow during June.	Per Cow July to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E ...	23·27	17·73	12,627	542·58	6,763·68	524·06	22·52	281·42	4·15
7/H ...	10	8·23	6,373	637·30	6,877·15	302·04	30·20	324·52	4·74
7/J ...	27	21·58	11,930	442·16	7,140·42	555·19	20·57	324·72	4·65
7/K ...	22·70	18·80	19,311	833·21	8,662·41	788·98	34·03	363·60	4·08
7/L ...	32·30	19·77	12,631	391·05	5,741·61	640·78	19·84	282·03	5·07
7/O ...	9	6·93	7,075	786·11	5,956·24	318·34	35·37	273·59	4·50
7/W ..	19·10	13·83	9,346½	489·01	6,812·82	423·02	22·14	306·44	4·52
7/Aa ..	11	7·93	3,106½	282·41	4,592·76	159·10	14·46	230·84	5·12
7/Dd .	13·37	11·93	8,422	629·91	6,567·58	429·44	32·12	328·08	5·10
7/Ee ..	16	12·67	2,995	187·19	4,800·34	138·15	8·63	209·14	4·61
7/Gg ..	13	10·33	5,031½	387·04	5,088·46	260·39	20·03	263·61	5·18
7/Hh .	17·67	14·67	8,877½	502·40	5,467·85	392·20	22·20	243·61	4·42
7/Kk .	25·40	15·03	9,734½	383·25	7,234·09	423·95	16·69	324·01	4·35
7/Ll ..	14	12·90	7,833	559·50	7,448·34	334·49	23·89	307·10	4·27
7/Mm .	31·80	26·40	24,101½	757·91	7,489·43	904·06	28·43	301·83	3·75
7/Nn .	23	15·60	10,076½	438·11	6,524·20	440·88	19·17	268·21	4·38
7/Oo ..	16·20	13·20	11,730	724·94	6,736·94	512·54	31·67	316·38	4·40
7/Pp ..	10·70	6·40	5,633	526·44	7,788·91	308·24	28·81	423·77	5·47
7/Qq ..	14·93	12·60	7,801	522·50	6,290·53	428·50	28·70	343·33	5·49
7/Rr ..	16·90	15·97	9,422½	557·54	5,993·61	430·52	25·47	279·37	4·57
7/Ss ..	23·70	16·07	12,181½	513·99	7,231·22	631·27	26·64	374·19	5·18
7/Tt ..	18·70	15·60	9,561	511·28	6,223·06	441·23	23·60	288·21	4·61
Means .	18·62	14·28	9,809·11	526·68	6,586·21	444·88	23·89	303·24	4·54

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JUNE, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during June.	Per Cow during June.	Per Cow December to June.	Per Herd during June.	Per Cow during June.	Per Cow December to June.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ...	19·63	16·63	11,686½	595·34	2,987·53	542·41	27·63	135·86	4·64
6/C....	18	14·97	15,244	846·89	3,484·87	629·50	34·97	148·54	4·13
6/F ...	23·80	19·13	19,302½	811·03	3,868·56	958·78	40·28	191·31	4·97
6/H ...	28	18·40	16,577½	592·05	2,934·55	777·56	27·77	139·53	4·69
6/O ...	18	13·03	8,834½	490·81	3,190·78	454·38	25·24	167·95	5·14
6/X ...	20	14·60	9,109½	455·48	4,337·97	383·60	19·18	184·40	4·21
6/Y ...	21·30	16·60	9,700	455·39	3,089·33	419·35	19·69	140·33	4·32
6/Ee ..	45	29	10,935½	243·01	2,879·59	486·54	10·81	135·14	4·45
6/Ii ...	30·87	25·83	15,477	501·05	4,235·81	720·01	23·31	195·98	4·66
6/Kk .	20	15·13	5,690	284·50	3,460·50	250·66	12·53	159·59	4·41
6/Ll ..	22·40	20·07	8,483	378·70	3,634·07	367·55	16·41	151·65	4·33
6/Oo ..	17	12·50	10,080	592·94	4,928·07	437·42	25·73	130·38	4·34
6/Pp ..	18	15·90	11,022	612·33	4,250·09	548·09	30·45	206·27	4·97
6/Qq ..	25·97	19·10	11,996	461·92	4,585·53	499·21	19·22	209·35	4·16
6/Rr ..	27·53	18·07	12,569½	456·57	4,433·38	524·37	19·05	198·81	4·17
6/Tt ..	22	19·63	12,615½	573·43	4,169·66	558·17	25·37	199·22	4·42
6/Uu .	30	19·93	14,297	476·57	3,545·34	623·32	20·78	158·56	4·36
6/Vv ..	25·77	19·63	15,116	586·60	4,876·42	700·61	27·19	227·59	4·62
6/Ww .	24·33	19·77	7,455	306·41	3,579·68	402·22	16·53	167·21	5·40
6/Xx .	26	20·20	12,280	472·31	4,164·64	535·97	20·61	184·50	4·36
6/Yy .	25	24·13	10,898	435·92	3,868·65	559·21	22·37	201·17	5·13
6/Zz ..	17·97	16·63	11,055½	553·60	4,643·52	518·15	25·95	217·80	4·69
6/Aaa .	17·97	11	5,612	312·30	2,230·21	288·08	16·03	117·85	5·13
Means .	23·68	18·26	11,566·80	488·55	3,756·99	529·79	22·38	175·10	4·58

STATE OF SOUTH AUSTRALIA.

SUMMARY OF LIVESTOCK STATISTICS, YEAR 1931.

[By W. L. Johnston, Government Statist.]

I. Sheep and Wool.

1. *Number of Sheep.*—The sheep flocks on December 31st, 1931, numbered 6,608,981 (5,980,959), increase 628,022. These were classified as follows:—Ewes, 3,287,194 (3,058,544); wethers, 1,513,377 (1,625,405); rams, 86,061 (86,122). Under one year old, 1,722,349 (1,210,888).

2. *Breeds of Sheep.*—86.4 (86.3) per cent. of the flocks were returned as pure-bred Merino and 6.3 (7.1) per cent. Merino Comebacks, 1.0 (0.9) per cent. other pure breeds (Corriedale, Shropshire, Dorset Horn, Lincoln, Romney Mash, Southdown, Suffolk, etc.), and 6.3 (5.7) per cent. Crossbreds.

3. *Lambing,* 1931.—During the year 1931 2,717,101 (2,515,293) ewes were mated and 1,983,667 (1,427,003) lambs marked, exceeding the previous record of 1,740,620 in 1925. The percentage of 73.01 (56.73) is the highest since 1917—78.68 per cent.

4. *Winter Lambing,* 1932.—2,830,000 ewes were reported as either mated or intended to be mated for the winter lambing of 1932. In addition 180,000 ewes were expected to be reserved for spring lambing.

5. *Wool Clip.*—6,404,046 (6,059,246) sheep and lambs were shorn, the total clip including locks, bellies, pieces, &c., being 56,960,732 (53,748,376) lbs., increase 3,212,356lbs. The average weight of fleece for sheep and lambs combined was 8.89 (8.87) and for sheep only 10.75 (10.19) lbs.

6. *Total Wool Production.*—Subject to slight revision of fellmongered wool, it is estimated that the grand total wool production, including the clip and wool fellmongered and wool on local skins exported, was 66,162,687 (63,478,524) lbs., increase 2,684,163lbs., value £2,100,665 (£1,803,849), increase £296,816, the average value per lb. greasy being 7.62 (6.82d.).

II. Cattle.

1. *Numbers.*—All kinds 265,324 (218,985), increase 46,339. Dairying cattle 127,756 (109,672), increase 18,084, classified as follows:—In milk 90,767 (79,805), dry 23,171 (20,406), and heifers springing 13,818 (9,461). In addition there were 14,896 (13,591) other heifers one year and over which are not included in the dairying total, but which are possible additions to the dairying herds.

2. *Butter and Cheese.*—Provisional for 1931-32.—Butter 17,500,000 (12,961,231) lbs., previous record 17,244,389lbs. in 1923-24. Cheese 5,100,000lbs., previous record 3,901,159lbs. in 1930-31. Record quantities were exported.

III. Horses.

185,222 (183,529). This is the first increase since 1921.

IV. Pigs.

109,780 (82,991), being the highest since 1918.

V. Goyder's Line of Rainfall and Livestock.

During the year 1931 the percentage to the total of sheep outside Goyder's line of rainfall increased from 29.87 to 36.12, cattle 25.01 to 28.58, and horses 26.01 to 27.21. The numbers within and without the line for 1931 were: Sheep 4,221,994 and 2,386,987, cattle 189,488 and 75,836, horses 134,825 and 50,397.

VI. Interstate Movement of Stock.

The State gained 52,119 head of cattle, 312,603 sheep, and 2,585 horses by transit of stock between States. The total interstate imports were: Sheep 380,933, cattle 55,418, horses 3,595, and exports: sheep 68,330, cattle 3,299, and horses 1,010. Net export of horses to overseas countries 894.

VII. Slaughtering.

Sheep and lambs 1,378,931 (1,308,976), increase 69,955, including for export 135,386 (20,789); cattle 81,285 (89,585), decrease 8,300; pigs 114,313 (111,307), increase 3,006.

VIII. Value of Pastoral and Dairying Industries.

Provisional for 1931-32: £4,880,000 (£4,422,000), increase £458,000.

1. Livestock as at December 31st, 1931, in Comparison with December 31st, 1930.

Division.	Sheep.		Cattle.		Horses.	Pigs.
	1930. No.	1931. No.	1930. No.	1931. No.	1931. No.	1931. No.
Central	1,331,941	1,332,449	85,110	101,533	55,377	52,222
Lower North	858,189	954,230	24,556	30,808	38,098	18,368
Upper North	501,886	720,407	11,227	17,306	12,827	5,253
South-Eastern	1,383,228	1,276,646	33,635	36,810	13,042	7,881
Western	691,973	817,661	9,587	11,686	23,724	7,010
Murray Mallee	396,732	444,077	20,303	25,884	30,490	18,893
Total Counties	5,163,949	5,545,470	184,418	224,027	173,558	109,627
Outside Counties	817,010	1,063,511	34,567	41,297	11,664	153
Total State	5,980,959	6,608,981	218,985	265,324	185,222	109,780
Increase	- 205,293	628,022	14,469	46,339	1,693	26,789

Livestock within and without Goyder's Line of Rainfall, 1929 to 1931.

Year.	Sheep.		Cattle.		Horses.	
	Total.	%	Total.	%	Total.	%
Within Goyder's Line of Rainfall.						
1929	4,548,246	73·52	149,246	72·98	141,992	75·11
1930	4,194,587	70·13	164,206	74·99	135,786	73·99
1931	4,221,994	63·88	189,488	71·42	134,825	72·79
Without Goyder's Line of Rainfall.						
1929	1,638,006	26·48	55,270	27·02	47,062	24·89
1930	1,786,372	29·87	54,779	25·01	47,743	26·01
1931	2,386,987	36·12	75,836	28·58	50,397	27·21

Wool Producpion.

Division.	Wool Clip.			Average Weight Fleece.		
	1930-31.	1931-32.	Increase.	1930-31.	1931-32.	Increase.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Central	11,765,186	11,163,914	—601,272	8·44	8·32	—0·12
Lower North	8,412,480	8,498,807	86,327	9·55	9·50	—0·05
Upper North	4,949,640	6,386,752	1,437,112	9·71	9·88	0·17
South-Eastern	11,204,533	10,022,208	— 1,182,325	8·00	7·94	—0·06
Western	5,831,681	6,570,909	739,228	8·19	8·26	0·07
Murray Mallee	3,645,962	3,932,659	286,697	9·21	9·18	—0·03
Total Counties	45,809,482	46,575,249	765,767	8·66	8·68	0·02
Outside Counties	7,938,894	10,385,483	2,446,589	10·35	10·03	—0·32
Total State	53,748,376	56,960,732	3,212,356	8·87	8·89	0·02

Grand total wool production (clip, fellmongered, and on skins exported), subject to slight revision, 1930-31, 63,478,524lbs.; 1931-32, 66,162,687lbs.; increase, 2,684,163lbs.

Minus sign (—) denotes decrease.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1—WHITE LEGHORNS.

Competitors.	Address.	Score to Month ending July 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals.
Austwick, S.	West Marden	(1) 47	(2) 65	(3) 45	157
Barker, C. R.	Edwardstown	(4) 50	(5) 54	(6) *	104
Bolland, H.	Knoxville	(7) *	(8) 50	(9) 23	73
Butson, A.	Clarence Park	(10) 54	(11) 51	(12) 61	166
Carmichael, A. B.	Woodville West	(13) 48	(14) *	(15) *	48
Carroll & Leedham	Forest Gardens	(16) 53	(17) 42	(18) 44	139
Carter, W. A.	Glandore	(19) 40	(20) 69	(21) 26	135
Cleland, W. L.	Beaumont	(22) 26	(23) 51	(24) †	77
Cooke, B.	Kanmantoo	(25) 12	(26) 49	(27) 79	140
Cooper, Syd.	Edwardstown	(28) 47	(29) 37	(30) 26	110
Crawford, L. H.	Grange	(31) 74	(32) 8	(33) 33	115
Crittenden, R. C.	Kilkenny North	(34) 49	(35) 79	(36) 73	201
Dawes, A. G.	Glenunga Gardens	(37) 71	(38) 39	(39) 69	179
Dawes, A. G.	Glenunga Gardens	(40) 40	(41) *	(42) *	40
Dawes, A. G.	Glenunga Gardens	(43) 74	(44) 43	(45) *	117
Dawes, A. G.	Glenunga Gardens	(46) 72	(47) 49	(48) 43	164
Dawes, A. G.	Glenunga Gardens	(49) 22	(50) 35	(51) 72	129
Dawes, A. G.	Glenunga Gardens	(52) 38	(53) 85	(54) 45	168
Dawes, A. G.	Glenunga Gardens	(55) 56	(56) 48	(57) 54	158
Duhring, T.	Mallala	(58) 51	(59) 30	(60) 50	131
Easther, Colin J.	Black Forest	(61) 60	(62) 39	(63) 74	173
Edgcumbe, J. L.	Plenty, Victoria	(64) 59	(65) 65	(66) *	124
Fidge, H.	Clarence Park	(67) 16	(68) 58	(69) *	74
Fox, Russell H.	Edwardstown	(70) 16	(71) 15	(72) 57	88
Gilbert, L. H.	Glanville Blocks	(73) 22	(74) *	(75) 50	72
Goldsmith, Keith	Kensington	(76) 63	(77) *	(78) *	63
Gore, A. G.	Summertown	(79) 79	(80) *	(81) 69	148
Gurr, A. & H.	Scott's Creek	(82) 15	(83) 67	(84) *	82
Hefford, H. H.	Murray Bridge	(85) *	(86) *	(87) 47	47
Hefford, H. H.	Murray Bridge	(88) 73	(89) 33	(90) *	106
Hillyer, Jas.	Kilkenny	(91) 43	(92) *	(93) 70	113
Hodgson, W. H. A.	Salisbury	(94) 13	(95) 7	(96) 31	51
Lamerton, E. A.	Edwardstown	(97) 53	(98) 58	(99) *	111
Lindquist, E. F.	Semaphore Park	(100) *	(101) 61	(102) 79	140
Lindsay, Mrs. P. G.	Croydon	(103) 36	(104) 26	(105) *	62
Morris, H.	Seaton Park	(106) 45	(107) *	(108) 19	64
McPherson, K. R.	Blackwood	(109) *	(110) *	(111) 6	6
Nicholls, H. R.	Eden Hills	(112) *	(113) *	(114) *	—
Oliver, J. H.	Goodwood Park	(115) *	(116) *	(117) *	—
Radbone, T. B.	Colonel Light Gdns.	(118) 35	(119) 39	(120) 60	134
Rassmussen, H. A.	Ethelton	(121) *	(122) 48	(123) *	48
Woodbury Poultry Farm	Crafers	(124) *	(125) 31	(126) 43	74
Woodbury Poultry Farm	Crafers	(127) 44	(128) 58	(129) 73	175
Rowe, Bruce	Two Wells	(130) 70	(131) *	(132) 51	121

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitors.	Address.	Score to Month ending July 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 28	(134) *	(135) 73	101
Slape, W. C.	Magill	(136) 78	(137) 27	(138) 72	177
Thomas & Elson	Hawthorn	(139) 51	(140) 36	(141) 46	133
Thomas & Elson	Hawthorn	(142) 48	(143) 51	(144) 69	168
Vowels, C. C.	Westbourne Park .	(145) 54	(146) 64	(147) *	118
Welford, F. F.	Colonel Light Gdns.	(148) 13	(149) 21	(150) 59	93
Urlwin, A. P.	Balaklava	(151) 20	(152) 39	(153) 39	98
Wiese, W.	Cabra	(154) †	(155) 22	(156) *	22
Wiese, W.	Cabra	(157) *	(158) *	(159) *	—
Williams, F. J.	Millswood Estate ..	(160) *	(161) 43	(162) *	43
Williams, W. R.	Frewville	(163) 32	(164) 68	(165) †	100
Williams, W. R.	Frewville	(166) 78	(167) 33	(168) 55	166
Woodley, W.	Tailem Bend	(169) 36	(170) 31	(171) 47	114
Connor, D. C.	Gawler	(172) *	(173) 56	(174) 52	108
Tolhurst, A. E.	Torrens Park	(175) 17	(176) *	(177) 45	62
Gurr, A. & H.	Scott's Creek	(202) *	(203) *	(204) 61	61
Totals	....	2,121	1,980	2,090	6,191

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

Gameau, V. F.	Woodville	(178) 15	(179) 39	(180) 30	84
Totals	....	15	39	30	84

Anconas.

Williams, W. R.	Frewville	(181) 10	(182) 16	(183) *	26
Totals	....	10	16	*	26

SECTION 3—BLACK ORPINGTONS.

Richardson, N. F.	Woodville.........	(184) 65	(185) 78	(186) 86	229
Cook, Arthur	Colonel Light Gdns.	(187) 75	(188) *	(189) *	75
Cooke, B.	Kanmantoo	(190) *	(191) *	(192) 64	64
Crago, Jack	Prospect	(193) 25	(194) 28	(195) *	53
Crawford, L. H............	Grange	(196) 72	(197) 37	(198) 34	143
Dowling, J. H.............	Glossop	(199) *	(200) *	(201) *	—
Hudson, F. J.	Prospect	(205) 84	(206) 55	(207) *	139
Mills, H. J.	Edwardstown......	(208) 18	(209) 59	(210) 89	166
Mills, H. J.	Edwardstown......	(211) 49	(212) 85	(213) *	134
Rawe, J.	Seaton Park	(214) 77	(215) *	(216) *	77
Schubert, B. O.	Tanunda	(217) 11	(218) *	(219) 27	38
Frisby Smith, G.	Fulham	(220) 24	(221) 37	(222) 67	128
Twartz, H. L.	Gawler	(223) 67	(224) 43	(225) 66	176
Williams, W. R.	Frewville	(226) 90	(227) *	(228) 14	104
Williams, W. R.	Frewville	(229) 26	(230) 72	(231) *	98
Woodley, W.	Tailem Bend	(232) *	(233) 76	(234) 78	154
Totals	....	683	570	525	1,778

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Fidge, H.	Clarence Park	(235) 41	(236) 35	(237) 8	84
Gameau, V. F.	Woodville	(238) 76	(239) 30	(240) *	106
Williams, W. R.	Frewville	(241) 64	(242) 34	(243) 49	147
Totals	....	181	99	57	337

* Denotes disqualification under Regulation 13 (Weight of Eggs). † Dead.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE-TEST EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the supervision of the Department of Agriculture.

LEADING SCORES TO WEEK ENDING AUGUST 4TH, 1932.

SECTION 1.—WHITE LEGHORNS.

	Scores.	Laid for Week.	Bird Nos.
Singles—			
A. G. Dawes	88	5	53
R. C. Crittenden	82	5	35
A. G. Gore	81	4	79
C. F. Lindquist	81	4	102
B. Cooke	81	4	21
W. C. Slape	81	5	136
Trios—			
R. C. Crittenden	210	—	34— 36
W. C. Slape	184	—	136—138
Woodbury Poultry Farm	182	—	127—129
Teams—			
A. G. Dawes	337	—	52— 57
Thomas & Elson	310	—	139—144
A. G. Dawes	308	—	46— 51

SECTION 2.—ANY OTHER LIGHT BREED.

Black Minorcas.

Singles—			
V. F. Gameau	39	1	179
Anconas.			
W. R. Williams	19	5	182

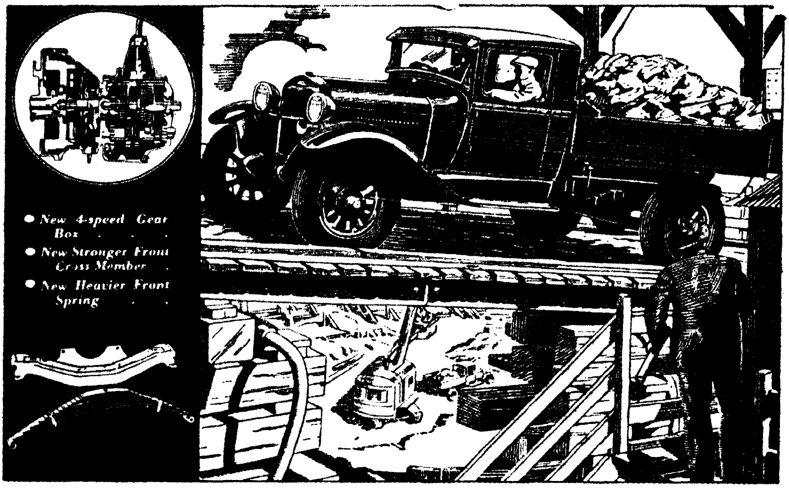
SECTION 3.—BLACK ORPINGTONS.

Singles—			
W. R. Williams	92	4	226
H. J. Mills	88	5	212
F. J. Hudson	87	6	205
N. F. Richardson	86	—	186
Trios—			
N. F. Richardson	235	—	184—186
H. L. Twartz	185	—	223—225
Teams—			
H. J. Mills	314	—	208—213 (Five birds competing.)

SECTION 4.—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Singles—			
V. F. Gameau	78	3	238
W. R. Williams	66	3	241
W. R. Williams	51	4	243
Trios—			
W. R. Williams	153	—	241—243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● New Heavier Front Spring . .

Greater strength and increased power . . . from these Ford Truck improvements!

THE recent important improvements to the Ford 30 cwt. Truck greatly extend the strength, performance and value of a truck already famous for its power, speed, strength, low price and low running costs.

Power and Speed **. . . . Tremendous pulling power and higher road speeds result from the New 4-speed Gear Box . . . 5 ball and roller bearings in the gear box mean that in all forward speeds the entire drive (from engine to road wheels) is on frictionless bearings . . . A Power Take-off is provided for tipping or for belt-work jobs.**

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PAPERS READ AT CONFERENCES.

MY EXPERIENCE DURING TWO MICE PLAGUES.

[By L. B. HUGHES, Goode.]

(Ceduna Conference, July 7th, 1932.)

The first mice plague experienced was that which occurred in 1917, and in my opinion it was far worse than the one experienced this year. This was because farmers were not able to get their wheat away as quickly as they did this year, which speaks well for our efficient railway service and up-to-date harvesting machinery. During the seeding of 1917 I sowed a little of the crop dry, which turned out well, but that which I sowed wet was promptly taken by mice. I stopped seeding until July, and when I started again only sowed about 100 acres as I thought it was getting too late. I should have continued, however, because the late rains which fell made the crop a payable one. I intend sowing later this year in the hope that history will repeat itself. I made a stand for the seed wheat by placing posts in the ground with benzine tins on top, but it was a failure. I then made a mouse-proof yeard, and into this I shot the wheat in bulk, but the mice scratched underneath and got up into the wheat, and to make matters worse weevils made their appearance. This practice cannot be recommended unless the wheat was very dry and could be turned occasionally. The recent plague did not do much damage to the dry-sown areas, but the area drilled in under wet conditions in most cases had to be reseeded.

This year again proved that the plague mice were able to climb so-called "mouse-proof yards." A very efficient stand can be made by putting posts in the ground and placing on top of them half sheets of galvanized flat iron, and laying cross pieces on top of the iron. Reject railway irons are ideal for the latter purpose and can be purchased cheaply from the railways. In the future, any stacks I build of wheat or hay will be built on one of these stands, because mice are prevalent more or less every year on farms and do considerable damage. All feed should be kept out of the reach of mice. They thrive on grass seeds, and grass paddocks should be burnt as early in the year as possible. Seeding should be started early. The ground should be worked so as to make a deep seed bed. Drilling through stubble is even better than sowing after the rain. Poisoning should be carried out early in the year with S.A.P. or phosphorus mixed with pollard and adding a little treacle. Strychnine is best after the rain; mix it with flour. The best trap I have seen is made by sinking a benzine tin in the ground with a drop of water in it. The plague mouse is thirsty and can be easily caught with poison water. All stands should be fairly high, as mice will run up a high post and then jump on to wheat stands. Do not sow after the first rain, and wait till the mice have moved on.

THE VALUE OF SHEEP ON THE FARM IN UPPER NORTHERN AREAS.

[By E. H. HAMPEL, Wilmington.]

Papers read at the Upper North Conference, Black Rock, July 20th, 1932.

Sheep are undoubtedly the most profitable sideline that can be run on the farm. They require little attention and are self-producing, there is no depreciation, and the flock will return a substantial profit each year. In seasons when there is an abundant growth of herbage and grasses sheep will be found very helpful to the farmer by keeping weeds in check before the plough and cultivator which otherwise would be allowed to waste and become a hindrance to the ploughman.

The number of sheep that can be kept on a farm will depend entirely on the amount of grasses and foodstuffs that are available throughout the year, and the greatest care should be taken to avoid overstocking. There should be a plentiful supply of water to which the sheep have free access. Fences should contain six wires and be in reasonable repair.

BREED FOR THE DISTRICT.

In my experience, I have found the Merino ewe mated with the Merino ram to be the soundest and most profitable proposition. Purchase, if possible, ewes between two and three years of age and only of a good standard, strong constitution, large frame, clean points, and fairly free from wrinkles. They should carry an even fleece of preferably strong wool, showing plenty of character.

For every 100 ewes three rams will be required, which should be well selected. It must be remembered that inferior rams will soon deteriorate the flock, and if the most is to be made out of sheep, then they should be maintained at the highest possible standard. This can only be done by careful selection of the rams, and rigid culling of the ewes from year to year.

I am definitely of the opinion that a farmer should be a breeder of sheep and not a dealer; this will mean that the best ewe lambs are selected each year, and retained for breeding purposes, thus taking the place of those passed out.

MANAGEMENT.

Like all other livestock, sheep require proper management to be most profitable. Dipping is important and should be carried out from six to eight weeks after shearing. Generally speaking, the middle of November will be found the most suitable time to join the rams; this ensures an April-May lambing, which is an ideal time of the year for such purpose. Crutching is very necessary and should be done preferably with machines in the beginning of March. The sheep should be handled very carefully during this operation, which, if thoroughly carried out, will reduce the blowfly pest to a minimum.

Lambing.—A paddock should be reserved for this purpose. Horses and cattle must not be allowed to graze with the ewes whilst lambing, and whenever an opportunity offers, take a walk around the sheep to see that all is well. Dogs are best left at home unless they are well trained.

Lamb Marking.—This may be done at the end of May or the beginning of June. If possible, avoid cold and frosty weather; also see that the lambs are returned to their mothers and back in the paddock well before sundown. Thorough cleanliness should be observed during this operation. Kerosene and olive oil applied to the wounds is most helpful. It is advisable either to brand or number the lambs whilst this work is in progress.

Shearing.—Everyone will agree that September is the most suitable month for shearing, and if a depot shed is available within a reasonable distance, the sheep should be taken there to be shorn, so that the wool will be properly classed and put up in the most attractive style for the buyers, whereby the highest possible price may be obtained. Failing this, they may be shorn on the farm in some convenient shed, which must be free from dirt, chaff, &c. Under these circumstances do not class the wool. Take off any pieces that may be wet or soiled around the breech, placing these on a rack to dry. The fleece can then be rolled and placed in the bale.

Bellies and lambs' wool should be baled separately. Place the mark on each bale and number them, using stencil plates, and when consigning, advise the brokers to reclass, for which a small charge is made. Then the clip will be classed by experts and interlotted, thus gaining the highest price possible for it.

Culling and Casting.—Culling for wool is best done on the shearing-board, and all sheep having yellow, hairy, unattractive and short stapled fleeces should be raddled off. Casting for age and constitution is also necessary and can be most conveniently carried out in the branding race, after which all the raddled sheep should have a number placed on them and the whole flock branded.

Now that so much has been said for selection and management, what may one reasonably expect from 100 ewes, even at present low prices for lambs and wool? The increase may be safely estimated at 80 per cent. and losses in the ewes at 5 per cent. Therefore, let it be assumed that 95 ewes are shorn, averaging between 7lbs. and 8lbs. of fleece wool and about 3lbs. of oddments. The lambs will easily average 3lbs. of wool.

The rams will pay for themselves during their service by the wool they produce in that time, and so need not be mentioned in the following summarised statement of income and expenditure, in which are shown the gross profits of one year and the necessary deductions.

The prices set down for wool and lambs are those obtained during last year, and are as nearly as possible an average that was received.

Gross Profits.

	£	*s.*	*d.*
700lbs. fleece wool at 8d. per lb.	23	6	8
300lbs. oddments at 4d. per lb.	5	0	0
240lbs. lambs' wool at 3d. per lb.	3	0	0
80 lambs at 10s. each	40	0	0
Total gross profits	£71	6	8

Expenditure.

	£	*s.*	*d.*
Warehousing commission and freight on wool	6	7	0
Commission on lambs	2	0	0
Shearing	4	0	0
Dipping	0	16	8
Crutching	1	0	0
Woolpacks, branding oil, &c.	0	15	0
Total expenditure	£14	18	8
Showing a net return of	56	8	0
	£71	6	8

Or the equivalent of 11s. 3d. per ewe.

PIG BREEDING AND BACON CURING.

[By B. J. G. Schuppan, Wilmington.]

In my opinion sufficient attention is not paid to the breeding of pigs which entirely differ in type and quality, and each breed should be used for the purpose for which it is best suited. From a curing point of view it is quite true that any pig will make bacon or ham, yet it must not be forgotten that every pig is not a good baconer or suitable for curing.

Breeders and curers should lay down a definite standard, setting out the advantages or otherwise of the various breeds. One can breed exactly what is required from the breeds of pigs from which it is possible to make a selection, including the Berkshire, Mid-York, or Poland China and Tamworth. Each of these breeds has been highly recommended by the curers, yet none of these breeds is perfect, and a great improvement could be made by devoting a little time and attention to breeding.

The Berkshire is an ideal pig, one which we regard as the best from a curing point of view, yet it carries rather too much fat in proportion to lean, and is slow in maturing. Further, in many cases the sows are shy breeders. Many instances are on record where three or four big litters have been produced and then the sow ceased breeding. This appears to happen in the Berkshire more than in any other breed. This drawback could be easily overcome by the introduction of new blood.

For a curing pig I favor a well-bred Berkshire sow mated with a Mid-York boar. This progeny should be crossed with a Poland China and then mated back to the Berkshire boar, and from this offspring the breeders can be selected. This type of pig will prove of the highest quality. Nice shapely pigs, very similar to the Berkshire but longer and deeper in the body, fine hair, well proportioned with fat and lean, very good curers, meat not too soft and flabby, which is very often the case with many of the other breeds, which are meant for pork, and not for ham and bacon.

If factories would pay more attention as to the class of pig suitable for the various types of meat, there would be a ready demand, and better prices obtained for the produce. As the factories are mainly working on light weights—from 80lbs. to about 120lbs. for baconers—it means that feeding has to be forced to place the pigs in the market at four to five months. Such meat is immature, and it is impossible to cure good quality stuff from an unsuitable article. One cannot obtain good beef from a calf of that age, and the same applies to pigs.

In curing, it is necessary to avoid shrinkage and loss of weight, which would be very considerable in a young pig. This can only be overcome by feeding gradually and allowing the pigs to mature at about 200lbs. or more. From a pig of this weight one should be able to cure meat which would keep at least nine months, after which period another pig could be treated. There are three months of the year during which it is possible to cure successfully, and if this plan was adopted the house would be supplied with ham and bacon all the year round and so result in a great saving in the butcher's bills. Now that pigs are so cheap, it would be more economical to kill and cure as much as possible and keep the profit on the farm. If all producers were to follow on these lines, it would help to strengthen the demand and firm the prices of the market. If one has more than his own requirements, it is not difficult to find a ready market for it. Where the pigs would only realise from 4d. to 6d. per lb. through the market, it would be possible to obtain at least from 8d. to 10d. for the cured meat.

If it is intended to adopt this latter plan, care should be taken to class and joint the meat. A pig contains at least six or seven different "cuts" of meat, and each is valued at a different price—some up to 1s. 6d. per pound when prepared, yet when used as pork or sold in the market one has to be satisfied with 5d. per lb.

In jointing a pig, cut down the centre of the back with a sharp knife, then cut down each side of the ribs, in the inside. The pig would then be in halves, with the backbone on one side. Run the knife along the other side of the backbone and the sides will be ready for jointing. Place on a block and carefully remove the kidney fat. Next, remove the lean strip of meat above the ribs along the back. This can be done by starting at the shoulder and working towards the ham. It may be necessary to use the knife along the back to separate the meat from the fat. Now remove the ribs by carefully drawing a sharp knife under them. Start at the shoulder and gradually work backwards until the short ribs are reached, which should be far enough to run out. The ham of a neat shape should then be removed. After this, cut the meat straight through behind the shoulder. This can be made into shoulder ham or it may be jointed. The sides of the bacon will now have a strip of fat along one side which must be removed. This strip of fat is used for lard.

The meat is now jointed and ready for salting and curing. Rub each piece separately according to size. The heavier pieces—hams and shoulders—should receive a heavier dressing of salt. Store the meat to allow it to drain for at least 24 hours. By this time most of the blood will have drained out and the meat will not stain the brine. When preparing the brine, do as before mentioned: keep the hams and shoulders separate. For these the strength of the brine should be about 1¾lbs. of salt to every 1gall. of water, with the addition of ¼lb. of saltpetre to every 10galls. of water. For the bacon and remainder of meat, use 1¼lbs. of salt with the same quantity of saltpetre. Boil the brine, but care must be taken that the brine is thoroughly cool, and it should be put outside overnight. The time of curing will depend on the size and weight of meat.

A ham of 15lbs. will take at least four weeks, 20lbs. five weeks, 25lbs. to 30lbs. at least six weeks to salt. The bacon will require two weeks' curing. The cured meat should then be placed in a tub of fresh water for at least 12 hours to soak and then hung to drain for four or five days, when it should be ready for smoking. This should be done under as even a temperature as possible. Bring the meat to a sweat, but do not allow it to drip. About two days' smoking should be sufficient, providing the heat has been regular. A better plan if it can be done is to smoke it for one day, then allow three or four days to elapse and smoke for another day. The meat should then be hung in a dry safe place until required for use.

THE USE OF PRODUCER (OR CHARCOAL) GAS FUEL FOR FARM TRACTORS.

[L. M. W. JUDELL, B.Sc., F.S.A.S.M.E., Jamestown.]

In this paper it is proposed to give a brief survey of the adaptation of the use of producer gas fuel for use in farm tractors, without any attempt to enter into the details of design of apparatus, and with as few technicalities as possible. During the past two years the wheatgrowing farmer has been forced by low wheat prices to do his utmost to lower his costs of production. Power is certainly only one factor in the schedule of costs, but it is an important one, and offers considerable scope for effecting economies. About 4,000 tractors are used on wheat farms in South Australia; these have practically all been imported, and the fuel, which also comes from abroad, costs annually somewhere about six hundred thousand pounds.

HISTORICAL.

Producer gas, or suction or charcoal gas as it is sometimes called, is not a new discovery. It was used a hundred years ago in France, Germany, and Belgium as the base for illuminating gas. The general use of internal combustion engines, primarily using coal gas, led to the utilisation on a large scale of producer gas as a cheaper fuel in all parts of the world from about 1880 onwards. In Australia this gas has been used very widely for smaller power units, in flour mills, pumping plants, country town electric light installations, mines, and mills, &c. In France the lack of domestic supplies of liquid fuel or good coal led to the development by French engineers of serviceable gas producers, to enable wood charcoal to be used as a fuel for motor trucks. In 1927 there were several thousand motor trucks in France operating with producer gas made from charcoal; the French Government encouraged the introduction and use of producer gas for commercial motor vehicles.

In 1927 the Commonwealth Development and Migration Commission deputed a Mechanical Transport Committee to investigate the possibilities of the use of producer gas for motor trucks in Australia. Through the courtesy of the Secretary of the Commonwealth Department of Transport (Melbourne), I have been supplied with copies of the detailed reports of extensive trials in France and Australia of this gas used in various makes of motor vehicles. Briefly summarised, these reports state that the trials generally were satisfactory, and led to great economies in fuel costs. Coming nearer home, early in 1931 Messrs. Smith & Son, agricultural implement makers, Ardrossan, made and placed on the market a gas producer for use with tractors; several of these were fitted to Holt tractors, and were operated in various parts of the State, particularly in the Appila district, where some trials were held. The gas producer used charcoal fuel, and gave fair results; the reasons why they did not come into more general use were probably excessive weight, inconvenient location of the producer on the tractor, and a fairly high first cost. It must be remembered that Messrs. Smith and Son were the pioneers of the introduction of producer gas fuel for farm tractors in this State, that their producers were strongly made, and constituted a genuine and creditable attempt to offer to the farmer an opportunity to lower his tractor fuel costs.

The best practical results in the adaptation of producer gas as a fuel for farm tractors in South Australia, and probably in the Commonwealth, I consider have been obtained by Messrs. J. and W. F. Slattery on their farms, "Moorlands," near Jamestown. Messrs. Slattery Brothers sow about 1,600 acres of wheat annually and use three tractors. During the winter of 1931 they experimented with their own design of gas producer, and by November had evolved a producer which gave satisfactory results in their cultivating operations on their farm and in a trial conducted by the South Australian Committee, consisting of Messrs. J. P. Burnside, T. J. Bromley, M. Watson, W. A. Hargreaves, and W. L. Summers. Messrs. Slattery Brothers used two 2-ton Holt tractors operating on producer gas (charcoal) for their seeding operations, and to date have cultivated over 3,300 acres using this gas as fuel. They are now ploughing, using the same fuel, and report that a 2-ton Holt tractor is pulling a 7-furrow mould board plough quite satisfactorily. A feature of Messrs. Slattery Brothers' operations is that the gas producer is carried on the combine or plough, and not on the tractor. As regards their fuel costs, they combined in 1,600 acres at a cost for charcoal of £8, which works out at slightly over one penny per acre. The engines of the tractors working with this fuel are in first-class order, and show no signs of unusual wear or depreciation in any respect. There is no dilution of crank case lubricating oil through unconsumed liquid fuel, and Messrs. Slattery Brothers have found an extraordinary reduction in the quantity of lubricating oil necessary; they used one tractor to cultivate 600 acres with a consumption of only one quart of cylinder oil, and the drainage from the crank case at the end of that run was discolored, but still retained a good deal of lubricating quality.

NATURE OF PRODUCER GAS.

The gas is made by passing air and steam through a bed of incandescent (red hot) carbonaceous fuel. By reason of its accessibility, cheapness, and freedom from volatile matter, charcoal is the ideal material for making this gas for tractor purposes. When air is brought into contact with red-hot charcoal, what we call combustion takes place, heat is evolved, and the gas carbon dioxide is formed; this is a colorless, odorless, inert, incombustible gas. The carbon dioxide gas in passing through the bed of red-hot charcoal is changed into another gas, carbon monoxide, which has quite different properties to the dioxide; it is colorless, has a faint odor, is combustible, and when mixed with a certain proportion of air is explosive. Carbon monoxide is also poisonous, and care should be taken not to inhale producer gas. Steam or water vapor, in its reaction with the red-hot charcoal, forms hydrogen gas, and with air forms an explosive mixture. The formation of carbon monoxide and the decomposition of steam are both chemical reactions which absorb heat; this is fortunate, in that it prevents the development of excessively high temperatures in the gas producer furnace. Another chemical reaction which should not take place in the producer furnace, but sometimes does, is the formation of clinker. This is due to the presence, as an impurity in the charcoal, of earthy matter, which at the high temperature reacts with the potash and soda salts in the charcoal ash to form a fusible slag or clinker. The obvious way to avoid this troublesome clinker is to use only clean, retort or kiln burned charcoal, which is usually free from earthy matter. Producer gas, then, is a mixture of carbon monoxide (30 per cent.), hydrogen (8 to 10 per cent.), nitrogen (48 per cent.) from the atmosphere, which passes through the apparatus unaltered, some carbon dioxide (6 per cent.), and water vapor; the figures given are approximate only. It is a low-grade fuel gas, which possesses only about one-fifth of the calorific or energy producing effect of average coal illuminating gas.

USE OF PRODUCER GAS.

The problem of utilising efficiently this low-grade gas in a tractor engine designed for the use of comparatively high-grade liquid fuel is not an easy one to solve. There are certain difficulties which can be overcome, and other inherent disabilities which cannot be removed; it is desirable that these should be understood. It is desirable that the gas should be delivered to the engine cylinders as cool, clean, and dry as possible. As all gases expand in direct proportion to the temperature, when heated, it is evident that the cooler the gas, the denser it will be and the more energy units it will be capable of giving out per unit of volume. The necessity for cleaning out, by means of efficient scrubbers, all solid matter, such as dust, and all liquid matter which would damage or interfere with the cylinders, pistons, valves, and spark plugs, is self evident, and the drier the gas can be made the less dilution there will be by water vapor. It is not possible, by means at present known, to develop, with producer gas, the same power in a tractor engine designed for liquid fuel as that developed by the engine when using liquid fuel. That could hardly be expected. The loss of power when using producer gas in such an engine under most favorable conditions would be about 15 to 20 per cent. To obtain the best results with the use of producer gas as fuel, the engine should be specially designed. For instance, the compression of the mixture just prior to explosion should be not less than about 80lbs. per square inch. The power developed by an engine is calculated from the formula—

$$\text{H.P.} = \frac{\text{P.} \times \text{L.} \times \text{A.} \times \text{N.}}{33{,}000}$$

where P. is the mean pressure in pounds per square inch; L. the length of stroke in feet; A. the area of the piston in square inches; and N. the number of explosions per minute. The product must be multiplied by the number of cylinders in the engine.

Keeping this formula in mind, it is interesting to see how Messrs. Slattery Brothers have got the best result out of their Holt tractors when using producer gas as fuel. The mean pressure P. is certainly lower for producer gas than with kerosene or petrol, but this loss was minimised by increasing the compression ratio by making the pistons ⅜ of an inch longer and raising the compression to about 90lbs. per square inch; the length L. is the same, depending on the crank shaft; the sectional area A. is the same; the speed factor N. was increased from 900/1,000 to 1,300/1,400 revolutions per minute. At the same time the gear ratio was altered so that the travelling speed of the tractor remained about the same as in the original design. In other words, the gear ratio was stepped down and the original tractive effort practically maintained at about the original speed. These facts can only be generalised, as no dynamometer tests were made, but the results were borne out in actual work on the farm, where over 3,300 acres have been cultivated and tilled.

The relative merits of wood and charcoal as the fuel source for producer gas are occasionally debated, but for use with tractors I cannot see any advantage in using the producer as a charcoal retort and passing a large volume of volatilised water and other products of distillation through the apparatus and to the engine, as would happen in the usual up draught design of producer. The time taken to light up and start the tractor when using charcoal and gas is generally about 7 to 10 minutes with Messrs. Slattery Bros.' outfits. The producer holds three bags of charcoal, sufficient to run for about 5 hours without refuelling. No fan is used to assist the draught when starting; the top lid is removed, and the natural draught through the ashpit door up through the column of fuel is sufficient to get the fire well alight. The engine is started with a small amount of petrol and run for a few minutes to suck the gas through the scrubbers and to the engine through the connecting hose.

CONCLUSION.

The use of producer gas with tractors can never be as simple and fool-proof as is liquid fuel and it is doubtful if this gas will be very generally used on wheat farms. A certain amount of aptitude and understanding of machinery is necessary in order to make a success of the use of this cheaper fuel, but I feel certain that for such men there is a great field in South Australia for growing wheat on the large areas of light plain country at a lower cost than can be done anywhere else in the world. With low fuel costs, large areas can be covered with tractors and the problem of providing feed and water for horses in dry years is eliminated. This idea opens up a very interesting subject which time and space will not allow me to deal with here. The use of cheap, locally produced fuel for tractors on wheat farms is very well worth the attention of farmers or investors, particularly those who are of a mechanical turn of mind.

SHEEP SUITABLE FOR FARMING DISTRICTS OF SOUTH AUSTRALIA.

[By R. Elliot, Kulkawirra.]

(*Murray Lands, Karoonda, August 2nd*, 1932.)

Coming as I do from the edge of the western plains of Victoria, where some of the best wool in the world is grown, and having got the best part of my living from sheep for a good number of years, I am inclined to agree with the writer of an article which I read in the *Advertiser* some time ago, that there is grave danger of the raising of fat lambs spoiling the quality of farm-grown wool—few of the breeds of sires used in the production of fat lambs producing a desirable quality of wool—and there is such a mixed variety of sires being used that there is not likely to be any uniformity in the production of either lambs or wool, and we cannot afford to neglect either, there is too much risk in specialising in lambs, for judging by last year's happenings it is quite possible to glut the market for lambs, a large number of lambs from last season still being in cold storage very late in the year.

Wool is very low in price at the present time, but it will gradually right itself to a certain extent with more normal economic conditions. South Australians can do what has been done in other places to a certain extent: breed sheep that will give a good lamb, and also produce a good fleece of good quality wool.

THE POLWARTH.

In New Zealand the English Leicester crossed with the Merino has given good results and produced a large number of the best Canterbury lambs. This cross also produces a good quality wool, but the sheep that more nearly approaches the class for the Mallee is the Polwarth. This bred originated some 50 years ago in the Western District of Victoria, and is really a standardised comeback, and was originally bred by Messrs. Dennis Bros. and Mr. Wittenhall, all breeders of Merino sheep. The object which they had in view was to breed a class of sheep that would produce the best return in £ s. d. per acre. That they were satisfied with the results is evidenced by the fact that they and their sons have continued to breed up these sheep

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to the present time, and that other Merino sheep-breeders are now turning to Polwarths in preference to Merinos. Even the chairman of the Sheep-breeders Association, Mr. Edwin Currie, of Lismore, whom I think holds the record for a price paid for a Merino ram for Australia—3,000 guineas—now has a stud of Polwarth sheep. The name Polwarth was given to these sheep in 1919 at a meeting of breeders, and now there are 52 studs and flock-book flocks registered, only one of which is in South Australia—that of Mr. Sullivan, of Bordertown. The wool from these sheep always brings a price very little, if any, below that of the Merino, and the sheep cut very nearly the same weight of wool with less off the bellies and pieces, breed a much better lamb, produce a much better carcass of mutton, the ewes are good mothers, and rear their young well. There should be no reason why sheep of this class cannot be bred even more successfully in the Mallee than in Victoria, for the South Australian Merino is a much better sheep, particularly in point of size, than the Victorian Merino.

The origin of the Polwarth sheep is the Lincoln-Merino cross, the Polwarth being three-quarter bred Merino. These sheep were bred from selected sheep on both sides.

The easiest way to develop a flock of this type of sheep would be to use Corriedale rams on good class Merino ewes, the Corriedale being a standardised Lincoln-Merino half-breed. The main trouble in this district at the present time is to procure an even flock of ewes, and farmers will have to breed the ewes, culling as heavily as circumstances will permit. I have been breeding on the lines mentioned for the past three years, and have now mated ewes with Victorian Polwarth rams, and have the first drop of lambs by these rams running with the ewes. We also bought 105 Victorian-bred Polwarth ewes, which also have their first drop of lambs for this district at foot now. The rams which were bought in the wool were rather smaller than I expected, but were very short-legged and solid when shorn, very like the Southdown in conformation, with neither horns nor wrinkles. I anticipate that the locally-grown Polwarths will grow to a much larger size than those in the colder climate of Victoria. Lambs by Corriedale rams have weights up to 50lbs. at five months old, and in the Victorian Mallee Polwarth lambs have been credited with attaining the weight of 45lbs. to 50lbs. at 13 weeks old. One of the advantages claimed by breeders of these sheep is that the wool is so even in quality that the whole clip can be put up in one or two classes. This depends on the care of the breeder in culling unsuitable sheep, but registered flocks have to be subject to regular inspection by an expert.

HORSE BREEDING.

[By J. R. McKenzie, Pinnaroo.]

(*Pinnaroo Line Conference, Jabuk, August 4th,* 1932.)

Horse breeding is a very interesting and at the present time a very remunerative occupation. Unfortunately, the farmer does not always pay enough attention to the type of horse that he is breeding, although farmers are not to blame for all this. There has been such a serious falling off in horse breeding the last 10 or 12 years that stud breeders have not had any sale for their stallions except the very best, and the rest have all been gelded, hence now that there has been a revival in horse breeding, there are not enough good young stallions to meet requirements, and farmers are inclined to use any stallion without thought of type or breeding.

When a breeder sets out to breed horses or form a stud, he should have a certain standard in view and aim to produce a certain type of horse. To do this—if it is impossible to secure mares possessing the desired qualities—the breeder should use a stallion bearing as nearly as possible the required characteristics. By doing this for several generations it will be possible to gradually grade up to the required type.

Some of the leading breeders adopt line breeding, and this is the quickest way to fix a standard. Line breeding calls for a good deal of inbreeding. The inbreeding of stock possessing certain desirable qualities tends to intensify those qualities, but it also tends to bring out undesirable characters that may have existed in past generations. Therefore, to fix a standard, the stud breeder must be ever rigorously culling his stock, and using only those that conform to the required standard.

As the foregoing is not always applicable to the average farmer unless he is going in for stud breeding, an outline of some of the principles a farmer should follow when breeding horses for farm purposes will prove of interest. The farmer should not endeavor to breed from any or every mare he has, but select some of the best for the purpose. There are several qualities he should pay attention to, such as the disposition of the mare, her working qualities, and a mare that is naturally a good doer.

In the choice of a stallion the farmer often has to use whatever is available, but if he can choose between several stallions he should endeavor to select one most suited to his mares. If a mare has a certain fault he should try and avoid that fault in the stallion, and if there are certain characteristics he desires, he should then try and secure the services of a stallion possessing them. It must always be remembered that the better the parents are bred, the more uniform will the progeny be, and uniformity is a very desirable quality in a team of horses. Only stallions that are free from hereditary unsoundness should be used.

Having selected the mares and the stallion to be used, they should be mated in the months of September, October, and November. October is the best month for mating in this district, because the mare will foal in September, when the weather is warm and there is plenty of greenfeed available. Four years of age is the best time to start a mare breeding, although mares have started to breed successfully at a much younger age. "Dunure Footprint"—the most famous stallion in the history of the Clydesdale breed—was foaled when his dam was only 2 years and 10 months old. If one has valuable brood mares, the practice of breeding from them at 2 years can be adopted, but this is not advisable from ordinary farm mares.

CARE OF BROOD MARE.

It is a good practice, when a mare has been served, to leave her out of the team for a few days, and keep her as quiet as possible. When the mare is in foal she can be used for ordinary farm work. The brood mare should not be regarded as one of the regular team, but more as a spare horse. By doing this, it will be possible to get a lot of work from her, and not hurt her. Avoid heavy wagon work, if possible, and never use the mare to breech the wagon or dray. Breeching work is very harmful to a mare in foal.

When the brood mare is in the team, work her on the near side, and, if there is more than one brood mare, they should always be worked together. Care should be taken at gates, and if the gate is at all narrow the brood mare should be taken through separately. A brood mare should on no account be struck with a whip. The mare will be able to do ordinary farm work up to within about a month of foaling, and then kept apart from the rest of the team. When the mare is near foaling she can be kept in a small paddock near the homestead, where she can be watched. A little help at foaling is often very beneficial to both mare and foal. Many foals are lost or injured through no one being at hand when the foal is born.

The mare and foal should not be turned out with the rest of the horses until the foal is at least one month old, and then care must be taken, because the other horses become excited, and usually chase the foal. If it is possible to avoid it, the mare should not be worked while she is suckling the foal, but if she has to be worked, shut up the foal in a small yard. If the mare comes in very hot, allow her to cool before permitting the foal to suck. Usually by the time the team have walked home from the paddock she will have cooled sufficiently. Sucking the mare when she is overheated will cause the foal to scour. Wean the foal at six months old, especially if she is again in foal. If, however, the latter is not the case, and she is not required for work, the foal can be left on the mare longer. On no account must a foal be left on the mare the following season, when the mare is to be put to the stud again, because it is very difficult to get a mare in foal with a yearling sucking her.

Handle the foal as soon as it is born. If the foals learn to tie up, and are handled frequently about the head and legs, they never require any breaking in when they grow up, and should they meet with any accidents—as foals or young horses often do—they are always easy to handle. Inspire confidence in them, and they will never forget it as they become older..

Australian farmers are realising that, by producing their own farm power, and growing the fodder on the farm to feed them—thus using for home consumption what would otherwise be put on to an already over-supplied market—they are not only helping themselves, but are helping Australia out of her troubles as well. When the farmer is prosperous, everybody is prosperous. The slogan, ''Breed Horses for Prosperity,'' is a good one.

SHEEP, WOOL, AND WOOLCLASSING.

[By T. M. Rice, Pinnaroo.]

(Pinnaroo Line Conference, Jabuk, August 4th.)

Historical.

The first sheep to be imported to Australia were the Cape Fat Tail, about 1788. These sheep were of a variety of colors, covered with coarse, frizzled hair, and having large, fat tails, weighing up to as much as 10lbs.; hence their name. Two or three years later a poor type of sheep was imported from India. The Spanish Merino, which has made Australia the finest wool-producing country in the world, was imported by Captain Waterhouse about 1789 from South Africa. On reaching Botany Bay Captain McArthur offered him 15 guineas a head for the shipment (29 sheep). This offer was refused, and the Colonial authorities instructed Waterhouse to distribute the sheep amongst several settlers. McArthur managed to secure three rams and five ewes. He noticed that the sheep flourished in their new home, the wool becoming heavier, softer, and finer. In 1803 a sample of wool was sent to England, and valued at 6s. per lb. He saw great possibilities for the industry, so about the end of 1803 (his flock then totalled 4,000 sheep) he went to England, and endeavored to float a company, with the object of extending operations. His scheme was ridiculed by the English Government and by the capitalists; they considered that sheep would not live on the grasses and herbage in Australia, and that sowing English grasses would make the undertaking too expensive. However, he was able to purchase a few sheep from the King's stud, and, after a few more years in Australia, was noticed to be making such a success of his venture that other keen business men went in for sheep raising. Captain McArthur well deserves the title of the ''Pioneer of the Sheep and Wool Industry of Australia.''

The increase in numbers of sheep in Australia has been remarkable since 1792. That year the total was 105; in 1805 there were about 11,000; by 1842 the number had increased to over 6¼ millions. In the 1820's and 30's everyone seemed to be going in for sheep, and it was overdone. The boom burst in 1829. Sheep that had been worth up to £3 a head five or six years before were only bringing 2s. or 3s. per head. Boiling down was started, and continued for five or six years. Many squatters became bankrupt, and many were only saved by killing and boiling down their entire flocks. By 1850 conditions started to improve, and continued to do so at a more or less steady rate, so that by 1909 there were about 46 million sheep in the Commonwealth. The present total is, roughly, 110 millions.

THE FARMER'S REQUIREMENTS.

The aim of the average farmer is to produce a good lamb, and, at the same time, obtain as much as possible for the wool from the ewes. The Merino ewe will eclipse either the crossbred or the pure bred English ewes for wool. On the other hand, the half bred or crossbred ewe will rear a better lamb than the Merino in a much shorter time.

The average mallee farmer should have a flock of ewes that will cut a reasonably fine quality wool, and mate them in such a manner that, should it be impossible to dispose of all the lambs as lambs, they will also cut fairly fine wool.

SHEARING.

Shearing is a busy time. However, the work can be done expeditiously if the farmer has everything in readiness for the shearers. On many farms a shearing shed is not provided, or, if there is one, it is used for other purposes ten months out of twelve. As shearing time approaches the shed should be thoroughly cleaned out. All straw, chaff, binder strings, birds' nests, &c., should be removed. The gratings and yards should be put in good order; also the gates and shearing board. A suitable table should be provided for skirting and rolling the wool, as well as bins for the accommodation of the wool. Small bins are a mistake, and should be avoided. Farmers who have their own plants should have on hand a reasonable supply of duplicates, emery paper, oil, &c., and some suitable disinfectant for dressing cuts and possibly fly-blown sheep will be needed. Sheep should be drafted into suitable lines, *e.g.*, hoggets, wethers, ewes, etc., before shearing starts. This enables classing to be done more efficiently.

As the sheep are shorn, the fleeces are picked up and spread on the rolling table by the wool picker. The correct way to pick up the fleece is to stand at the neck end, and, reaching over, grasp the breech in both hands and draw the fleece towards you in folds until it can be lifted in the arms. On reaching the table the fleece is thrown towards the end away from the picker, always remembering to hold the breech until the fleece is at rest. Throwing the fleece is a job which requires a certain amount of practice. Fleeces will not stand much of a jerk, particularly Merinos, or they will break and land on the table in a tangled mass.

When the fleeces are thrown on the table they are skirted and rolled ready for classing. Skirting is perhaps the most important part of the work in the wool room. Its object is to remove all wool from the fleece that is detrimental in any way to the average wool in that fleece, thereby increasing its value. If the wool is free from burrs only a light skirt is necessary. Remove only the sweaty locks from behind the shoulder and round the breech, the short, hairy wool on the leg extremities, and the heavy-conditioned neck wool. If sand is present to any extent in the backs it will pay to remove them. If there is a moderate number of burrs, and these can be removed by taking a fairly deep skirt, it is advisable to do so; but if the fleece is burry all over no good purpose will be served by doing more than a little skirt. When skirting is finished the fleece should be rolled as follows:—Fold in the neck, then fold the fleece in thirds from one side to the other, and roll from the breech to the shoulder. This should leave the best wool of the fleece—viz., the shoulder wool—on the outside. As the fleeces are rolled they should be set aside, the first twenty or thirty, at any rate, to enable the classer to set a standard for the lines he may intend making, then classed into their respective bins.

There are five important principles to be taken into consideration in classing wool, namely, *length*, *strength*, *quality*, *color*, and *condition*. Lines should be made as even as possible, remembering each of these principles. *Length* explains itself. *Strength*, or *soundness*, is also more or less self-explanatory. There are three degrees of soundness, viz., sound, unsound, and tender. Lines of even strength must be made, or a loss of competition of buyers will result. Some manufacturers cannot handle tender wool economically. *Quality*, *i.e.*, spinning quality, refers to the fineness or coarseness of the wool fibre. Values, to a large extent, are based on quality. The terms used to describe quality are known as "counts"; for example, 60's, 56's, 36's, &c. When wool is termed a 60's quality it is meant that 1lb. of scoured top will produce 60 hanks of yarn each 560yds. long. A pound of 70's scoured top will produce approximately 22 miles of spun yarn. *Color*, or brightness, is a term which explains itself. *Condition* refers to the amount of grease or foreign matter in the wool. Lines of even condition are essential if best results are to be obtained.

Locks, Bellies, and Pieces.—On the average farm there will be no more than sufficient to make a line of each of these. Do not put them into a bale all mixed together. The pizzle stains should be removed from the wether bellies and dried before baling or bagging; also any other wet wool. The bales and packages should be packed as neatly as possible and branded with stencils on both top and front.

OUR CROP COMPETITIONS.

[By R. C. JACOB, Geranium.]

(*Pinnaroo Line Conference, Jabuk, August 4th.*)

By introducing this subject to the deliberations of the Conference, it is hoped that a good discussion will be created on the matter, that both profit and pleasure may be the result. The writing of the paper has been prompted by the articles appearing in recent numbers of the *Agricultural Journal*, the "Cost of Growing Wheat on a Mallee Farm," and the review of the factors pointing to the success of the winning and leading crops in the County of Chandos and adjoining Mallee Competitions for the last few years, which are directly connected with our district, and so vitally concern our ultimate success.

The one proves the cost of growing wheat on standard lines, and the other points to the means of attaining or exceeding those results. Wheat Crop Competitions have been carried out in this district for a number of years, and the system has developed and been improved on until it has grown to be the largest competition in the State—if not in the Commonwealth—showing that an increasing number of farmers realise their value, but it is only in recent years that the details have been tabulated and analysed.

A greater number of entries would increase the value of those analyses tremendously by showing a truer average result. With a larger number of entries, the committee could either accept a lower entrance fee or give a greater number of more valuable trophies. The Competition would then grow both more valuable as a guide to raising the general average of production in the district and in interest to those concerned in it.

Owing to the forced curtailment in Government expenditure, the subsidy was withdrawn, and experimental work curtailed, so that it remains with farmers themselves to carry on and solve their problems in this respect; but they know they can rely on the Department of Agriculture for all the help that is possible. Some farmers even advocated further curtailment of Government expenditure in the Department of Agriculture but strangely we do not see these farmers figure in any attempt to fill the gap in this connection.

There may be some farmers who grow better crops than any in the competitions, or even average more than the average of the competition plots. If so, it is to be regretted that they cannot be persuaded to enter, and so have the secret of their better methods made available for the benefit of their less fortunate farmers, and thereby help to raise the average of production.

It may be argued that farmers do not need competitions as an incentive to increased production, but is there a farm that has yet reached the limit of its production, or can it be stated what the limit is? It is certain that the average in each distirct is well below the average of the best farmers in that district, and a well supported and organised competition would yield figures over a period of years that would point the way to definite results being obtained to raise that average.

It cannot be doubted that in this particular locality there has been a distinct improvement in the seed sown generally and a reduction in the amount of disease since the inception of the Competition. It must be admitted, therefore, that Competitions have an influence for good, and are worth while, but to obtain the full benefit from them, they must be improved, because stagnation leads to decay. That can be achieved by the committee, and farmers generally tackling the job with an open mind, and accepting both criticism and advice.

SUGGESTED ALTERATIONS.

In the first place, the basis of the Competition is a 50-acre plot of wheat, not confined to any definite shape, but must be marked out by flag or binder cut. It must contain no more than three varieties and must be in one piece, except under special circumstances. The class of land is not taken into consideration. This question is governed by the State Crop Competition for which the Royal Agricultural and Horticultural Society offers a valuable trophy. It is contended that if the trophy were for the whole farm, the result would be more satisfactory. Others hold the view that the area should be reduced, because the results would be more accurate.

From the point of view of improving average production it would be a great advantage if sufficient entries could be obtained to divide the Competition into two groups: say (1) first-class land; (2) second class, and even further by dividing the second into (*a*) crops grown on a fallow system, (*b*) crops grown on a rotation system, without fallow, because it is in the second class and poorer land that the weaknesses show up in the averages.

Most farmers can, by following approved methods, grow good crops on their best land in good seasons, and in some cases the production is nearing the limit according to the rainfall, which cannot be controlled, but nobody has yet definitely evolved a system to bring up the second class land to anything near the rainfall limit. It is not possible to control the rainfall, although the best use can be made of what falls. The condition of the land can be controlled and improved by correct methods. This, of course, is wrapped up with the question of drift. It is generally agreed that wheat cannot be grown profitably without fallow, and it is also evident that on some land fallowing cannot be continued indefinitely without serious results. If every farmer at the Conference would support systematically a Competition on these lines, it would not cost very much to organise, and the details would be of more value and lead to more definite results than any experiments carried out in one particular spot—provided records were well kept.

JUDGING.

Judging could be simplified by special committees being appointed in each district to draft out the best crops for judging. This question of judging is one that always comes in for criticism after a Competition of any sort, and while one has every confidence in the judge, it is realised that he may subconsciously be biased by certain factors; also that he can only see each crop once. Whoever the judge be, he will be limited by these same factors, and the only way of overcoming to a measure this disability, is by more entries, and so making the Competition stronger financially, so that expenses could be paid to two more judges and average of their estimates taken.

If actual yields could be taken as a basis of the Competition it would also overcome it, but there would be the danger of unfair methods being adopted, which would defeat the end of the Competition more quickly than anything else. Some farmers appear to lose sight of the fact that the crops are judged on ESTIMATED YIELD and that all crops are not in the same state of maturity when judged or seen in the same light or from the same aspect, and are disappointed because certain crops yield better than others that are estimated at a higher value. This is a difficulty that is hard to overcome, and it is more than probable that 20 judges would all get different results, and the only improvement that one can suggest is, as in the former case, three judges and take their averages.

The question of scale of points is another bone of contention, but any alteration would not produce any good results unless actual yield could be obtained. The committee no doubt are open to conviction on the matter and would be willing to back any system that could be shown to improve the efficiency and support of the Competition.

THE GAS PRODUCER ON A FARM TRACTOR.

[By L. Foale, Parilla.]

(*Pinnaroo Line Conference, Jabuk, August 4th.*)

In the course of this paper it is proposed to give as many points as will be necessary to give an outline of the gas producer as an economic proposition on a farm tractor, and to draw a comparison between a tractor which is guaranteed to do the work of 18 horses. The tractor has given great satisfaction on both petrol and kerosene, doing the work of 20 horses, pulling two 20-row combines during seeding and two spring-tooth cultivators of the same size working fallow. It did the work of 16 horses at fallowing time, working a 16-furrow gang plough; it has also worked two 14-discs sundercuts on rough ground. On good solid ground this tractor—which is a 30 Holt caterpillar—worked on top gear, with an occasional drop back to second on stiff grade, and to bottom going up sandhills. In heavy sandy country the tractor will only pull one machine; it has only drawn one 20-row combine on this class of country, but could easily work a 28-row machine.

With the gas groducer, the tractor loses from 15 per cent. to 20 per cent. of the power when working one machine only. It would work a 28-row combine or cultivator and a 16-furrow gang plough, but the pace is reduced from 30 per cent. to 35 per cent., which means that instead of doing from 5 to 6 acres per hour with petrol or kerosene, with the gas producer, taking into consideration that a stop to refuel must be made every 1 to 1½ hours, the acreage per hour is reduced to from 3¼ to 4 acres with the wider machines, and 2½ to 3 acres per hour with a 16-furrow gang plough. This gives some idea of the difference in the work which can be accomplished by the two fuels.

Costs.

One acre on petrol with petrol at 2s. 1⅞d. per gallon landed on the farm, including oil, costs approximately 1s. 5d. per acre; and on kerosene at 1s. 4d. per gallon, which had to be carted from station or depot, including oil, works out at approximately 1s. per acre.

A variation is also made if the working is light or heavy. My costs and working are based on a medium working of the land, on carbon monoxide gas produced from charcoal and water, with charcoal at a saleable value of £2 10s. per ton. The charcoal before being used must be rescreened and broken to a size a little larger than a walnut. This procedure entails a fair amount of work.

Fallowing with an 8-furrow heavy fallowing plough can be done for 5½d. per acre, cultivating fallow with a spring-tooth cultivator 3d. per acre, with a 16-furrow skim plough 4½d. per acre, seeding with a 20-row combine 3½d. per acre. These figures are approximate, but at the same time are very close to the mark. When the farmer makes his own charcoal, these costs are reduced very considerably, as the stumps *must* be carted off the land and can be carted straight to the pits for burning. The only outlay when the farmer makes his own charcoal is 1 to 1½ gallons of petrol per day, used for starting the tractor after each stop to refuel.

SORE SHOULDERS AND SORE BACKS ON HORSES.—PREVENTION AND CURE.

[By J. Bullen, Yurgo.]

There is an old saying, "Prevention is better than cure"; find the cause and the effects will disappear—such is the case in all animal ailments.

Causes.

Sores are frequently increased by ignorance, indifference, and want of intelligence. Bad-fitting collars and saddles are the most common cause. Conditions which influence the production of sores are the soft condition seen in horses that have done no work and are fat; poor condition of horses that are over-worked and underfed; dirty shoulders; rough work, such as rolling, logging, &c.; loose hames; undue pressure and friction. In fitting a collar or saddle it is important to study the horse's requirements.

Fitting the Collar.

First note the shape of the shoulders and the movements of the horse. The shoulders —when a horse is in motion—are constantly moving backwards and forwards, so that when fitting a collar bear in mind that while one shoulder is coming forward the other is going backwards, so that at no time does the collar rest on an even surface, as when the two shoulders are at rest.

Horses with upright shoulders, with well-developed muscles, are easy to fit and seldom give any trouble; while some are thick at the crest of the neck, others are thin, and some hollow in the neck. The collar should rest evenly on the shoulders and not be forced into position. It should fit closely to the neck without pinching, but should not rest on the neck in front of the withers. At this point there should be a space which will admit no more than the flat of the finger, and should be the same at the top and bottom of the collar, and no part of the fore wale or after wale should touch the horse. There should be no lateral movement. The best way to see if the collar is fitting properly is to take hold of the top of the collar with the right hand, and at the throat with the other hand, move the collar from side to side, at the same time pressing the collar to the shoulders. If there is play, the collar is too wide.

The next point is the depth of the collar. To test this, place the flat of the hand between the throat of the collar: if deep enough to take the flat of the hand it is all right—deeper than this is unnecessary and may be a source of trouble.

A new collar sometimes gives trouble, and it is well to soak the collar for about two hours in water before putting it on the horse, and it will go into shape more readily. Care must be taken to place a dry cloth or bag under the wet collar. Always keep the housing strap tight.

The hames should be fitted accurately into the space between the fore and after wale, care being taken that the draught is in the right place. On some makes of collars there is an extra piece of leather stitched on the after wale for the hame hooks to rest, and this also acts as a guide as to where the draught should be. The hame should be strapped firmly into position, in order to stop any up or down movement, but it must not pinch the collar.

Prevention.

Horses must be well groomed before any harness is put on them, and for this operation the oval scraper type of currycomb is favored, or a good dandybrush, paying particular attention to the shoulders and backs. As each horse is groomed, pass the hand down each side of the shoulders and on the back where the saddle fits, to see if there are any lumps or sores, &c. Always see that the collars fit properly. When horses are continually at work they begin to lose condition. This means a loose collar, which causes friction, undue pressure, and then sore shoulders. The remedy for this is to pack the collar until it is fitting again. To do this the use of clean super. bags is an excellent idea. First, cut off the double seam at the top of the bag, then fold the bag lengthways and place under the collar, care being taken that there are no creases in the bag. Look at both sides; it may be necessary to adjust the bag or bags before hooking on the chains. The broad hame hook gives a greater bearing surface and does not cut into the collar.

Another source of trouble is that some old collars become flattened and the after wale cuts into the horse. This trouble can easily be overcome by having the collar restuffed or by keeping the leather well greased and turning the leather outwards. For horses that are working on the pole of any implement, put a bag under the collar, because of the undue pressure on the top of the neck, owing to the lack of stuffing at this point of the collar. If the horses are troubled with boils on their shoulders a change of feed, such as wheat hay or a little sulphur in the feed and some laxatives—bran or Epsom salts in the feed—will effect a cure.

TREATMENTS THAT ARE WORSE THAN THE DISEASE.

Drivers occasionally place pads under their horses' collars to raise the collar off the sore. The remedy is worse than the sores, because the pressure on the shoulder is not even and very soon the horse has another sore where the pads have been. False collars—the type which are cut out of leather to fit the shoulder with one side smooth and the other rough—in theory these seem all right, but in practice they are, in my opinion, false. Oils and ointments only make the shoulders soft.

Remove the pressure and the sore will soon heal. To do this, cut the seam of a clean super. bag, fold it lengthways, then put a little smear of blacklead paste on the sore, place the bag in position where the collar fits, and place the flat of the hand over the sore; this will mark the bag with the blacklead. Then cut out a round hole three or four times larger than the mark. Place into position again and fasten the collar over the bag. If it still rubs, put another bag under, cutting it the same way as before. Always apply blacklead every time the collar is put on; this stops any of the bag or collar that may touch from sticking to the sore and making it worse.

Lumps may be treated in the same way, only in this case the black lead is not necessary; if the pressure is removed from a lump it will disappear, but this takes a long time.

The time to treat a sore is before it becomes too large, not when it is so inflamed and raw that the horse will not allow itself to be approached or touched. If the horse is unfortunate enough to be in this condition, which does sometimes happen in the case of a scald, then there is no alternative but to use a breastplate. These can easily be made out of a super bag, by first cuting off the double seam and folding lengthways; stitch a hook on about 6ins. from each end, but have no stitches next to the skin. Never make a breastplate too narrow—the broader the better. When working it has a sawing action, and this is obviously a greater source of friction. Always keep the breastplate clean; it has a tendency to soon become foul and caked with sweat.

SORE BACKS.

Sore backs are always brought about by a combination of friction and pressure. Always bear in mind that when a horse starts to lose condition it is from the muscles on the back that the flesh first disappears.

To fit a saddle the withers must not be pinched or pressed up. The central line of the back must have no pressure imposed upon it. The shoulderblades must have free movement. All the weight must be evenly distributed upon the muscles covering the top of the ribs attached to the spine, which extends from the play of the shoulderblades to the last rib. Always remember that a horse is not constructed to carry weight as are human beings. The muscles of the back act as a buffer, so that when a horse loses condition, bags will act as a good substitute. Sores on the back should be treated in exactly the same way as sore shoulders—by cutting a bag.

If a horse is being worked in a dray, always keep it well balanced; it is quite a common sight to see the driver riding right in the front of the dray and never shifting his position. It is just as bad with an empty dray or a loaded one. Bad sores should be bathed in a weak, warm solution of disinfectant, and if the horse is in a healthy condition the sore will soon heal. Boils should be lanced and the core taken out. "Do unto others as you would that they should do unto you." So apply the same to the horse, a good faithful servant.

THE ADVANTAGES TO BE DERIVED FROM A BUTTER AND BACON FACTORY AND FREEZING WORKS.

[By A. E. Howlett, Goode.]

(*Ceduna Conference.*)

Of late we have read quite a lot about prizes for export pigs, side lines competition, etc., in the *Chronicle*. The idea is indeed a good one and will prove beneficial to most farmers and the State in general. In the Ceduna district and the surrounding districts, however, I am afraid producers will derive no benefit whatsoever, because it is not possible to make the side lines a paying proposition by entering for competitions, even if there was a reasonable chance of taking a prize. We are too far away from the home market (Adelaide), railway freights and shipping rates, &c., being far too high for us to entertain the idea. For instance, a farmer in our locality forwarded to Adelaide five pigs, which realised £6 16s. 6d.. Charges for freight were £3 6s. 2d.; then he received word to say dock charges, &c., were yet to be deducted. The local market (Ceduna) is too small to be of any advantage whatsoever. The overseas market is right out of the question at present, because there are no facilities for disposing of products to meet the demand of an overseas market. After viewing the whole situation at a glance, it appears that there is no encouragement to go in for side lines on a firm basis.

After conversation with various settlers of long experience I am convinced that if we had an opening to compete in the overseas market the country is quite capable of carrying extra stock in all lines. If there was a butter factory at Thevenard—our deep sea port—we could then go in for cattle breeding and make it pay. The few cattle we have at present are indeed a very poor advertisement for the district, but as they keep the home going, that is all we need in our present position. There are a few farmers at the present time with about 15 to 20 head of cattle, but of a very poor type, and if they can keep them under existing circumstances, it is safe to assume that on an average a farm over here can carry 15 head of decent cattle.

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It costs very little more to keep a good, sound cow than the weedy ones we now have. The first item would be to find out the right type of cow suitable to this district, then with the combined efforts of farmers to procure this type. We could only start in a small way, as also would the factory, so each farmer should purchase as many cows as he can reasonably afford, and one farmer, or group of farmers, get a good bull.

FODDER CONSERVATION.

Now comes the main question of feeding our stock; our carrying capacities will naturally be governed by fodder reserves, because we are subject to drought conditions. First of all we will take hay chaff mixed with oats. There are times when we get a reasonably good hay cut, so when the chance comes we should stack as much as possible. Our farms are gradually getting worn out, so far as wheatgrowing is concerned, "take-all" is becoming a menace, and as oats help to combat this I shall deal with it later on. Cocky chaff fed with oats is going to be a last resource in extremely bad conditions. The most important feed of all, in my opinion, is ensilage. This is the safest method of reserving fodder, because it is practically indestructible, neither fire, floods, rabbits, nor mice will damage it; if well made it will not rot or decay, and can be taken out after a short period, or years after, in the same condition as it was put there if the job is done correctly. The fundamental principles of ensilage are:—(1) Harvesting the crop in a perfectly succulent condition; (2) handling and storing it before the green stuff becomes withered or dried out; (3) storing or stacking in such a manner as to exclude air.

There are three methods most commonly in use—the pit silo, the overground silo, and the stack. Of the three, I recommend the pit silo. With a dam sinking plough, a 6ft. scoop, and four good horses, a pit to hold about 300 tons can be taken out in about a week. Ensilage can be made out of almost any natural plant growth, besides cultivated plants, but the safest plan would be to grow more oats. Supposing a farmer holds 2,000 acres. Divide this into five paddocks; No. 1 paddock 400 acres of fallow, No. 2 paddock would be wheat on previous year fallow, No. 3 oats on the wheat stubble, No. 4 and No. 5 would be left for grazing. Two hundred acres of the oats would be cut for ensilage, and by the time this was harvested the remainder would be ready for hay; 100 acres would then be cut for hay, and the rest could be reaped for feed and seed. The water question is most serious, because in parts we have no permanent water supply. Although a section of the country I have in mind is on the Tod River water scheme, settlers are unable to make full use of it now. Failing the extension of the Tod River water scheme, we should have to build more underground tanks. If at any time the water supply was low, it would be possible to take the products into the town and bring back water.

Dairying and pig breeding are interwoven, for after the cream has been disposed of there will be a surplus of milk, and the result of this means pig breeding. This is where the bacon factory and the local market come in, because the local market would work in conjunction with a bacon factory.

The prospect of freezing works in the district would involve the rearing of fat lambs. The Merino ewes would be kept for producing wool, and crossed with a mutton-producing ram, it would be possible to keep either a certain proportion of the flock for breeding further Merinos, or replenish the flock with new stock, according to the condition, age, etc., of the ewes required for breeding fat lambs.

With a combination of a butter and bacon factory and freezing works farming in these parts would be a better paying proposition, and more interesting, especially the livestock breeding activities. We should then have a certain amount of money coming in regularly; it would lessen the gap between good years and total failures. Our farms would have the change of cropping, which is an essential point; the townships of Ceduna and Thevenard would benefit, because their unemployed would have constant work; farmers with families would have a means of providing work of interest for their boys and girls; we would have the opportunity of boosting and advertising our district; vacant blocks would no doubt be taken up; we would be able to run an agricultural show and take pride in it; and the railways would increase their revenue.

DISCUSSION.

Prof. Perkins stated that he agreed that it was very difficult for farmers in the distrist to engage in side lines to the same extent as those nearer the markets. Nevertheless, it should be possible in course of time to attain markets which would bring in a profit for their side lines. He had the advantage of keeping the accounts of a private farm in the Murray mallee. The farmer had had two wonderful seasons and had been able to grow wheat at 3s. 5d. a bushel after providing for a salary allowance. That was only possible because the farmer did something more than grow wheat. If he had grown wheat only, the wheat crop would have carried the whole of the cost of working the land, interest on capital and land valuation, rates, taxes, depreciation, and so on. The figures represented approximately £1,200, allowing for a salary of £300 for the farmer. This man kept a flock of sheep. The mere fact that he had these sheep relieved the wheat crop of portion of the £1,200. If he had no sheep and grew wheat over the whole of the farm once in three years the cost would have been 4s. 2d. per bushel, and over a four-years' rotation it would have cost 5s. 2d. Side lines, therefore, relieved the wheat crop of part of the costs, as all charges of the grazing area went to the sheep account.

Mr. W. L. Edson (Laura Bay) stated that he had a small farm and he would not give consideration to the keeping of cows as a side line. A butter factory was out of the question, as it would be too costly to run. Last year's crop paid him well, and if a farm could not be made to pay by sheep and wheat it could not be turned to profit by cows.

Mr. Howlett said if it could be proved that ensilage could be made in the district more people would go in for cows. He considered that there was a reasonable chance of making good ensilage this year. Some farmers were not making the full use of the Tod River where available. Even if everyone kept five cows the scope of producing butter was big enough to keep a butter factory going.

Mr. B. O. Klau (Goode) stated that it was a question of seasons. Last season quoted by Mr. Edson was an exceptional year. The matter should be placed on an average basis, say, over 20 pears, and he was of opinion that a farmer keeping side lines would be better off at the end of that period than one who ignored them. Side lines had pulled farmers through in other parts, and they would do the same in the Ceduna district. So long as farmers had good seasons everything went along all right without side lines, but two or three bad seasons would absorb all they made in good seasons.

TO-DAY

TO-DAY IS THE TO-MORROW YOU WERE THINKING OF YESTERDAY.

There is hardly anything that the average person procrastinates about quite so much as money saving, despite that the same average person has a comparatively small income, knows that he must spend carefully and save wisely, and knows, too, the best way to do it.

HAVE YOU DONE TO-DAY WHAT YOU YESTERDAY PUT OFF UNTIL TO-MORROW?

You can open a Savings Bank Account anywhere, because the Commonwealth Savings Bank is represented in every district in Australia, and with any amount, from One Shilling upwards. It is so easy—you have only to register your signature and deposit your shilling (or more) and you will have started on your saving campaign to-day.

Commonwealth Savings Bank of Australia

(E. C. RIDDLE, Governor).

Mr. Barlow (Chief Dairy Instructor) stated that the biggest question was that of marketing. He pointed out, too, that whatever side lines they took up must be managed intelligently, as it would be of no use keeping a few cows, pigs, and poultry and letting them run about the farm looking after themselves. The question of type in their stock was also of importance, just as good seed was necessary for growing of wheat crops. Although farmers were inclined to look down on cocky chaff as a drought food, he knew where this chaff—used properly—was giving good returns. By mixing with oats (crushed or whole) and feeding it with good oaten chaff wonderful returns were being obtained from 15 to 20 cows. It was being properly conserved, and in one instance a farmer had built a shed purposely to store the cocky chaff. With green feed that might be available and crushed oats it would give good results.

The making of ensilage should also be taken seriously. In a district like Ceduna they must have something to compare with natural pasture during dry periods. Even in the worst seasons there was generally something that could be turned into ensilage. The ideal was to harvest the crop in a succulent condition. If on the ripe side comparatively good results could be obtained by the addition of water when the ensilage was being made. Cereals, barley grass, and wild oats should be cut just as the heads were beginning to show. Whatever crop was being used it should be put into the stack before it began to wilt, and cut only what could be stacked the same day. The whole secret of making good ensilage was to exclude the air, and the quicker this was done the better the results. The only way to exclude the air from the stack or pit was by putting on as much weight as possible. There was no limit to the weight, and once the air was excluded and the material well compressed it would last a long period; he had seen it last eight years in very effective condition. The best improved country, continued Mr. Barlow, was that where the land was carrying livestock. Growing wheat alone appeared to him as a purely mechanised job, but an additional interest was given to the work of the farmer if he bred his own livestock. The men who were doing best out of land were those who were making money out of the natural increase of livestock on their holdings. In the pig trade the type and size of pigs controlled the price, and pigs should, therefore, be of proper size and well looked after. The only way to make a profit out of them at present was to put them on the market in the quickest possible time—not much more than, say, five months old. If they are kept, say, seven months, there would be a loss. Farmers should give a lot of consideration to the question of establishing a butter factory at Ceduna before taking any definite steps, as there would be a loss over the first few years.

He referred to the arrangements made with the freezing works at Port Lincoln to receive pigs when the works began treating lambs. Private negotiations are also being made to open the works as a bacon factory. He advised the farmers to co-operate in the matter of trucking instead of sending pigs in separate consignments. The Railways Department was willing to do anything reasonable with concerted action, but it could not be expected to cut freights for a few pigs sent by a single individual. Under the present conditions of the market it might be necessary to alter the type, as a lot of pigs were unsuitable. The bacon type would be the best kind to sell.

Mr. Shepherd told the delegates that many people in the South-East sent, say, half a truck of pigs at a time, and he thought that the railways would meet farmers on Eyre Peninsula similarly to those in the South-East. A cattle truck would hold about 60 pigs.

In reply to questions Mr. Barlow said buyers would take butter if it were bulked, but the difficulty would be to devise some means of bulking it. It would be necessary to send it at least once a week, but as in the case of marketing pigs the farmers must co-operate.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE AT EYRE PENINSULA (WESTERN).

The Conference of Branches of the Agricultural Bureau situated on the western districts of Eyre Peninsula was held at Ceduna on Wednesday, July 6th. Mr. N. D. McConechy (Maltee) presided over an attendance of delegates from Maltee, Goode, Laura Bay, Smoky Bay, and O'Loughlin. Others present were Messrs. S. Shepherd (Advisory Board of Agriculture), Professor Perkins (Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), W. H. Brownrigg (Agricultural Instructor), H. C. Pritchard (General Secretary Agricultural Bureau), and A. H. Robin (Veterinary Officer of the Stock and Brands Department. The local arrangements were ably carried out by Mr. E. Schwarz (Maltee).

The Conference was opened by Mr. S. Shepherd, who stated that in order to make a financial recovery South Australia must, in common with other States and other countries, get down to bedrock, but when the farmer was handicapped by tariffs there was very little encouragement for him to persevere. As an example, to-day it took 216 bushels of wheat to buy a ton of galvanised iron, whereas a few years ago the equivalent was only 95½ bushels. Many farmers, however, were given to extravagance and had sacrificed their teams for the purchase of tractors. If they had listened to the advice of Professor Perkins years ago they would be better off to-day. Farmers now realised that it was a good investment to breed horses, particularly if they had mares capable of throwing good stock. Renewed consideration should also be given to sheep, as wool would again be a profitable source of revenue. The hardy robust types of Merinos would live longer without water, would travel better than other breeds, and would eventually be a valuable adjunct to a mallee farm.

He considered that the Agricultural Bureau was of the greatest value to producers. There were over 8,000 members, and there was no reason why there should not be more. He pointed out that a member of the Bureau was virtually a member of the Department of Agriculture. Some farmers had said that the Bureau was of no use to them, as other members could not teach them anything. Even if that were true, it was a selfish view as it was the duty of such farmers to come forward and help others.

Mr. Shepherd said by meeting men in country districts he was, personally, still learning. The Bureau was the best means of getting in touch with farmers in his own as well as in other centres of the State. He paid a tribute to the work of the Agricultural Instructors, and he advised members to consult those officers when in difficulties over their farming problems.

He said he was pleased to see that the district was having a wonderful season, but he reminded his audience that they should not forget that they had experienced worries in the past and they must therefore not forget to make provision for the future. He knew of one district where, in the 'nineties, farmers tore down their sheds to feed their stock, whereas if they had conserved their fodder they would not have experienced any food shortage. Any fodder was better than no fodder, so long as it was well looked after and properly stored. He had a straw stack 16 years old on his farm, and it was still in good order. Although he got a consistent rainfall at Kybybolite, he conserved some fodder each year for safety.

He could see no reason why they in the Ceduna district could not grow wheat cheaper than in any other part of the State. The cost of production would, however, have to come down. Farmers could not go on paying £20 for wire when its economic value was only £10. If the farmer was robbed of his tools of trade an uneconomic condition arose. He reminded them that, on the other hand, if they must import goods they should buy those which were economical and would last for years.

In conclusion, Mr. Shepherd referred to the Turretfield farm, which was now being used as a seed wheat farm. He appealed to farmers to patronise it as much as possible. He said he hoped that they would eventually get Minnipa back as an experimental farm, as this class of departmental activity was of utmost assistance to wheat farmers.

Papers were read by Mr. L. B. Hughes (Goode), on ''Experiences During Two Mouse Plagues''; Mr. A. E. Howlett (Goode), ''Advantages to be Derived from a Butter and Bacon Factory and a Freezing Works''; and Mr. B. A. Klau (Goode), ''The State Bank and the Farmer.''

Several questions were answered by Departmental Officers, and at the conclusion of the Conference, Mr. A. H. Robin gave an address on ''Stock Diseases.''

The following resolution was carried: ''That delegates to Congress attend two-thirds of the session, and that the General Secretary be asked to notify Branches the number of sessions attended by their respective delegates.''

It was decided to hold the next Conference at Ceduna under the auspices of the Smoky Bay Branch.

CONFERENCE AT BLACK ROCK.

Upper Northern Branches of the Agricultural Bureau met in Conference at Black Rock on Wednesday, July 20th. There was an excellent representation of delegates from the Wepowie, Orroroo, Morchard, Eurelia (men's and women's), Willowie, Murraytown, Black Rock, Jamestown, Tarcowie, Wilmington, and Wirrabara Branches.

Messrs. F. Coleman (member of the Advisory Board of Agriculture), Prof. A. J. Perkins (Director of Agriculture), C. F. Anderson (Poultry Expert), W. G. Bennett, B.V.Sc. (Veterinary Lecturer, Roseworthy Agricultural College), E. L. Orchard and J. O. Hatter (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary, Agricultural Bureau) attended on behalf of the Department of Agriculture.

Mr. C. T. Kuerschner presided, and the secretarial duties were in the hands of Mr. R. E. Kitto. Mr. F. Coleman delivered the opening address, and the following papers were read and discussed:—''The Value of Sheep on a Farm in the Upper Northern Areas,'' Mr. E. H. Hampel (Wilmington); ''Pig Breeding and Bacon Curing,'' Mr. J. G. Schuppan (Wilmington); ''Producer Gas Power for the Farmer,'' Mr. L. Judell (Jamestown).

A large number of questions were answered during the Free Parliament session, and the following resolutions were carried:—''That the 1933 Conference be held at Morchard.'' ''That the second terminal school holidays be held concurrently with the Adelaide Royal Show.'' ''With the view to encouraging more country subscribers, the Postmaster-General be requested to make a 25 per cent. reduction on rentals for all subscribers over three miles from an exchange who have been connected for a period of seven years or more.'' ''That as soon as possible after seeding each year the names of the wheats that are available at the Turretfield Farm, and also the approximate costs or terms under which same may be procured, be published in the *Journal of Agriculture.*'' ''That the Government be asked to send out veterinary surgeons into the country to investigate when two or more stock die from an unknown cause.'' ''That the compulsory rule *re* new members taking the *Journal of Agriculture* be rescinded.'' ''That this Conference requests the Department of Agriculture to investigate the adaptation of the use of producer gas fuel for general use in tractors in South Australia.'' Conference concluded with an address, ''Prospects of the Coming Export Season for Eggs,'' delivered by r. C. F. Anderson (Government Poultry Expert).

KAROONDA CONFERENCE.

Branches of the Agricultural Bureau constituting the Western Division of the Murray Lands area met in Conference at Karoonda on Tuesday, August 2nd, 1932. Mr. C. S. Coombs (Kulkawirra) presided and the secretarial duties were carried out by Mr. H. J. Elliott, delegates being present from the following Branches:—Wynarka, Karoonda, Borrika, Kulkawirra, Copeville, Windsor, Nunkeri, Kalyan, Yurgo, Marama, and Bowhill.

The Department of Agriculture was represented by Messrs. J. B. Murdoch (Member Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Government Poultry Expert), W. G. Bennett, B.V.Sc. (Veterinary Lecturer Roseworthy Agricultural College), R. L. Griffiths, P. H. Suter (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary Agricultural Bureau).

The opening address was delivered by Mr. J. B. Murdoch, and, at the instance of Mr. H. Brown (Borrika), seconded by Mr. G. Tregilgas (Yurgo), it was decided to place on record a vote of appreciation to Mr. Murdoch for his interesting address.

The following papers were read and discussed:—''Sheep for the Farming Districts of South Australia,'' Mr. R. Elliot (Kulkawirra); ''Wheat Diseases,'' Mr. A. P. Hein (Kulkawirra); ''Sore Shoulders and Sore Backs on Horses,'' Mr. J. Bullen (Yurgo); ''The Problem of Making Farming Pay in the Mallee,'' Mr. H. Sanders (Yurgo); ''Grasses for the Mallee,'' Mr. C. L. Bruce (Karoonda).

A certificate conferring the honor of Life Membership of the Agricultural Bureau was presented to Mr. A. Hood by Mr. Spafford. Addresses were delivered by Messrs. C. F. Anderson, H. B. Barlow, and W. G. Bennett. Numerous questions were answered by Officers of the Department, and the following resolutions were adopted:—

''That the 1933 Conference be held at Karoonda with arrangements in the hands of the Wynarka Branch.''

''That in view of the increasing importance of the keeping of livestock, it is recommended that allowances for fencing be made immediately available and more liberal and that the Act be administered by the Government on the advice of the district councils.''

''That this Conference requests the Government to transfer one of the Veterinary Officers of Stock and Brands Department to the staff of the Department of Agriculture for the purpose of giving advice to farmers.''

Conference concluded with an address, ''Stock Ailments,'' by Mr. W. G. Bennett, B.V.Sc.

PINNAROO LINE CONFERENCE.

The Annual Conference of Pinnaroo Line Branches, attended by an excellent representation of delegates from the Lameroo, Geranium, Parilla, Clanfield, Lameroo, Pinnaroo, and Parrakie Branches, was held at Jabuk on August 4th. The chair was occupied by Mr. F. Elwood (President of the Geranium Branch of the Agricultural Bureau). Mr. L. S. Prouse acted as Conference Secretary. Messrs. A. L. McEwin (Member Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agri-

MEGGITTS
LINSEED
MEAL
FOR POULTRY

culture), H. B. Barlow (Chief Dairy Instructor), W. G. Bennett, B.V.Sc. (Veterinary Lecturer, Roseworthy Agricultural College), C. F. Anderson (Government Poultry Expert), P. H. Suter, R. L. Griffiths (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary, Agricultural Bureau) attended on behalf of the Department of Agriculture. The agenda was a lengthy one, and included the following papers:—"Crop Competitions," Mr. R. C. Jacobs (Geranium); "Sheep and Wool on the Farm," Mr. T. M. Rice (Pinnaroo); "Producer Gas for Tractors," Mr. J. Foale (Parilla); "Horse Breeding," Mr. D. McKenzie (Pinnaroo); "The Origin and Objectives of the Lameroo Horse Breeding Society," Mr. W. F. Morcomb (Lameroo); and an address, "Sheep in Mallee Areas," by Mr. W. J. Spafford (Deputy Director of Agriculture).

Mr. A. L. McEwin presented to Mr. D. Orwell, of the Clanfield Branch, a Life Membership Certificate of the Agricultural Bureau.

RESOLUTIONS.

During the session devoted to Free Parliament, a large number of questions were discussed, and the following resolutions were carried:—"That the 1933 Conference be held at Pinnaroo with arrangements in the charge of the Parilla Well Branch; failing this, Parilla Branch will hold the Conference at Parilla"; "That this Conference ask the Government to renew the subsidy previously granted to Crop Competitions because of their influence on wheat-growing and the dependence of the recovery of the State on this industry"; "That in the opinion of the Conference existing legislation should be altered to permit of clean used super. bags being used as containers for livestock foodstuffs"; "That this Conference strongly protests against the high price of superphosphates"; "That the Government considers the advisability of introducing a scheme whereby groups of farmers will be enabled to purchase high-class stallions"; "That in the opinion of this Conference, Congress should be directed that the new rule *re* membership should be rescinded, and that a *Journal* levy on all members be introduced and paid by each Bureau member entitling him to a copy of the *Journal*"; "That this Conference desires an extension of time for the concession rates on super. carried on the railways to April 30th each year"; "That this Conference urges the Government to increase the travelling allowances of the Agricultural Instructors to allow them to get out amongst the farmers more than at present"; "That the postal authorities be urged to allow at least Adelaide bound letters from Wilkawatt, Parrakie, Geranium, and Jabuk to be carried on the lines on Saturday mornings. This would not entail longer hours to the post officers concerned, but would be a boon to the districts concerned"; "That the Department be requested to supply copies of the judges' full report of Crop Competitions to members of the Committee and Secretaries of Branches within the district"; "That in the opinion of this Conference and in view of the importance of the wheat-growing industry to the State, the subsidy to wheat-growing Competitions should be renewed"; "That Conference urges that the Department of Agriculture endeavor to arrange a date during the last week in September to hold the next Pinnaroo Line Conference"; "That Conference strongly urges that the Minister of Railways provide (without the usual guarantee) a rail car for delegates to travel on our railway to District Conferences."

Mr. H. G. Johnston (Secretary of the Chandos Crop Competition) read the annual report and balance-sheet, and trophies as follows were handed to the successful competitors by Mr. McEwin:—First prize, Mr. P. Ross, Parrakie, 93½ points (gold watch); second prize, Mr. W. N. Johnson, Parilla, 89 points (grandfather clock); third prize, Mr. H. G. Angel, Pinnaroo, 88½ points (rose bowl); fourth prire, Mr. W. J. Ross, Parrakie, 88 points (inkwell). *Junior Competition.*—First prize, C. G. Johnson, Parilla, 87 points (silver cup); second prize, M. Hutchens, Parilla, 86½ points.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, July 27th, there being present:—Messrs. H. N. Wicks (Chairman), A. J. Cooke (Vice-Chairman), F. Coleman, A. M. Dawkins, S. Shepherd, A. L. McEwin, P. J. Baily, J. B. Murdoch, Professor A. J. Perkins (Director of Agriculture), and H. C. Pritchard (Secretary). Apologies were received from Messrs. P. H. Jones and J. W. Sandford.

Re-appointment of Members.—Messrs. P. J. Baily, F. Coleman, A. J. Cooke, A. M. Dawkins, P. H. Jones, and H. N. Wicks, who retired by effluxion of time on June 30th, 1932, were re-appointed by the Hon. Minister of Agriculture for a further period of two years.

Appointment of Chairman and Vice-Chairman.—Mr. H. N. Wicks was appointed Chairman and Mr. A. J. Cooke Vice-Chairman for the ensuing 12 months.

Size and Quality of Cornsacks.—Information was received from the Comptroller-General of Customs that the necessity for close supervision in order to ensure that the prescribed conditions are maintained has been strongly brought under the notice of the Collector of Customs in the several States. The Secretary was instructed to report this matter to the Annual Congress.

Telephone Rentals and Subscribers' Book.—The following resolutions were carried at the Upper North Conference:—"With a view of encouraging more country telephone subscribers the Postmaster-General be requested to make a reduction on rentals for all subscribers"; "that the Postmaster-General be approached and requested to publish a telephone subscribers' book including all telephone subscribers in the State of South Australia." It was decided to bring these requests under the notice of the Postmaster-General's Department.

Southern Conference.—The Board agreed to the request of the 1931 Southern Conference for a division of this district, and decided that the place of holding the Conference of the Western Division should be placed on the agenda of the 1932 Southern Conference.

Life Membership.—The names of Messrs. G. G. Pitt (Balhannah), A. Hood (Wynarka), and D. Orwell (Clanfield) were added to the roll of Life members of the Agricultural Bureau.

New Branches.—Application was made by the Metropolitan Dairymen's Association to establish a Branch of the Agricultural Bureau. The Board conditionally approved of the formation of the Branch, to be known as the Adelaide Branch of the Bureau. Approval was also given to form a Women's Branch at Balumbah, with the following ladies as foundation members:—Mesdames Rowe, Swann, H. Wohling, Ellis, Norris, Jericho, Deer, S. Wohling, Franklin, Riches, L. Stutley, and Marinho.

Alteration of Locality of Branch.—The Board decided to close the Clare Branch and to grant a transfer to Stanley Flat.

Change of Name of Branch.—Approval was given to change the name of the Bunora Branch to Balumbah.

New Members.—The following names were added to the rolls of existing Branches:—Streaky Bay—J. H. Heron, L. Lindquist, D. M. Drever, J. N. Drever, J. C. Drever; Pinnaroo—T. M. Rice; Mangalo—D. Munday, C. Brus, L. Brus, H. Mackley, M. Hannemann, O. E. Hannemann, C. Hannemann, S. Hannemann, R. Hannemann; Snowtown—G. Woodhouse; South Kilkerran—O. W. Arnold, L. E. Hasting; Redhill—T. H. Torr, jun.; Streaky Bay—J. L. Carter; Saddleworth—A. J. Jones; Parilla Well Women's—Mrs. C. Holmes; Modbury—E. Strahan; Paskeville—S. H. Sloan; Mount Compass—A. C. Gibson; Penola Women's—Mrs. W. Mitchell, Mrs. F. O. Lynn, Mrs. A. H. Reschke, Miss K. Sharam, Mrs. E. Kidman, Mrs. S. Waters, Mrs. C. F. Provis; **Penola**—J. G. Harmer, E. Kidman, C. McMurtrie, R. H. Milway, C. F. Provis; **Langhorne's Creek**—B. Norman, H. G. Norman; **Cungena**—R. Adkins, C. F. Nykiel, L. Hollamby, S. H. Bennie; Gladstone Women's—Miss Stephenson, Mrs. E. S. Hillard; Belalie Women's—Miss Mitchell, Mrs. C. Crouch; Kelly—H. E. Pearson, T. Hutchens, R. J. Beinke, F. R. Illman, I. W. Bartram; Balhannah—M. T. Cameron, Dr. Linn, B. Hector, L. Johncock; Berri—W. H. Chilton, G. D. Colton, M. Lean, E. Rout; Ashbourne—H. Sullivan, E. W. Jarman; Brownlow—E. Boehm, R. Steinborner; Belvidere—C. Cross, J. Vivian, sen., A. B. Eckert, B. Westley.

Number of new members for approval	68
Number of present members	8,325
Number of Branches	317

Several items were taken in Committee.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., JULY, 1932.

IMPORTS.

Interstate.

Apples (bushels)	57	Bulbs (packages)	24
Apples, Custard (bushels)	3	Plants (packages)	52
Bananas (bushels)	10,267	Roots, Grass (packages)	1
Citrus—		Seeds (packages)	27
Grape Fruit (bushels)	14	Trees, Fruit (packages)	75
Oranges (bushels)	65	Wine Casks (Nos.)	2,287
Passion Fruit (bushels)	202		
Paw Paws (bushels)	3	*Fumigated—*	
Pineapples (bushels)	1,407	Citrus—Oranges (bushels)	60
Tomatoes (bushels)	17	Plants (packages)	14
Nuts—		Trees, Fruit (packages)	64
Peanuts (bags)	134	Wine Casks (Nos.)	19
Peanuts, Kernels (bags)	35		
Popple (bags)	1	*Rejected—*	
Beans (bushels)	9	Potatoes (bags)	161
Carrots (bags)	4	Secondhand Bags (No.)	13
Potatoes (bags)	9,453	Secondhand Cases (No.)	3

Overseas.

(State Law.)

Wine Casks (No.)	599

Federal Quarantine Act.

	Packages.	lbs.		Packages.	Super. ft.
Seeds, &c.	3,051	478,188	Canes	126	
Tea Chests	3,938	—	Timber	84,764	1,876,252
Cocoanut Chests	491	—			

EXPORTS.

Federal Commerce Act.

		Packages.			Packages.
England	Oranges	147	Netherlands East Indies—*continued*		
India	Apples	1,303		Potatoes	5
	Oranges	3		Celery	24
Netherlands				Other Vegetables	41
East Indies	Apples	1,096	Singapore	Apples	150
	Pears	60		Pears	5
	Oranges	445	Oranges		214
	Lemons	7		Lemons	32
	Almonds	5		Other Vegetables.	81

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co., Limited, reported on August 1st, 1932:—

Butter.—Splendid weather conditions continued throughout July, and with precipitations of rain every week, interspersed with moderate temperatures, has resulted in the pastures coming forward apace. Production of dairy produce has therefore steadily increased, and the outlook for the season is very promising indeed. Already heavy quantities of butter are going forward each week to London, and owing to the standard of quality being satisfactory, there has been no difficulty in disposing of the surplus. Choicest creamery fresh butter, in bulk, 1s. 2¾d.; prints and delivery, extra (these prices are subject to the stabilisation levies); well conditioned store and collectors', 8½d. to 9½d. per lb. at store door, less usual selling charges.

Eggs.—These also have shown a seasonal increase, but until sunnier conditions obtain, the improvement is somewhat slow. In the meantime, however, shipments are being packed for London, and owing to the local prices this season being considerably in advance of last year's values, producers are materially benefiting from this profitable side line on the farm. Ordinary country eggs, hen or duck, 10½d. per dozen; selected, tested, and infertile, higher.

Cheese.—The South-Eastern factories are marketing increased quantities each week, and report that the conditions in that part of the State are most favorable. Several shipments have already been made this season to London, and it is expected that record quantities will go forward during the balance of the season. New makes, large to loaf, 7¾d. to 8¼d.; semi-matured and matured, 10d. to 11d. per lb.

Bacon.—The consumption of bacon during the winter months is always much greater than during the warmer period of the year, and althought the turnover throughout July was well maintained, the factories were able to meet all requirements of the trade without difficulty. Values have continued fairly steady, and with supplies of live hogs in the Abattoirs and other markets being plentiful, no difficulty is anticipated with regard to stocks during the coming months. Best local sides, 8½d.. to 9d.; best local factory cured middles, 9¼d. to 9¾d.; large, 8½d.; local rolls, 6½d. to 7d.; local hams (raw), 1s. to 1s. 0½d.; cooked, 1s. 2d. to 1s. 3d.; lard, prints, 6d. per lb.

Almonds.—The supplies of almonds were fairly large during the month under review, but throughout buyers operated freely, and all lots met with ready clearance. Values have continued fairly steady. Brandis and softshells, 9d. to 9½d.; hardshells, 5d. to 5½d.; kernels, 1s. 11½d. to 2s. per lb.

Honey.—Ample stocks of all grades were available throughout July, and although local trade was well maintained, there was only a limited interstate trade available, and considerable stocks were carried over at the end of the month. Prices are steady. Prime clear extracted, in liquid condition, 4d. to 4½d.; second grade, 2d. to 3d. per lb.

Beeswax.—Meeting with good demand; 1s. to 1s. 1d. per lb.

Live Poultry.—Our markets were fairly well supplied throughout July, with consignments both from country districts and suburban yards, and keen competition resulted. We anticipate that the strong winter demand will continue as none of the poulterers at present are carrying extensive stocks. We advise consigning. Crates loaned on application. Prime roosters, 3s. 6d. to 4s. 6d.; well conditioned cockerels, 2s. 9d. to 3s. 4d.; fair conditioned cockerels, 2s. 3d. to 2s. 8d.; chickens, lower; heavy weight hens, 2s. 8d. to 3s. 7d.; medium hens, 2s. 2d. to 2s. 7d.; light hens, 1s. 8d. to 2s. 1d.; couple of pens of weedy sorts, lower; geese, 3s. 6d. to 4s. 6d.; prime young Muscovy drakes, 3s. 9d. to 5s. 3d.; Muscovy ducks, 2s. 3d. to 3s.; ordinary ducks, 1s. 9d. to 2s. 1d.; ducklings, lower; turkeys, good to prime condition, 8d. to 9½d. per lb. live weight; turkeys, fair condition, 6d. to 7½d. per lb. live weight; turkeys, fattening sorts, lower; pigeons, 4d. to 5d. each.

Potatoes.—6s. per cwt.

Onions.—New season's, 23s. per cwt.

MEGGITTS
LINSEED
MEAL
FOR COWS, PIGS & POULTRY

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of, and to the end of July, 1932, also the average precipitation to the end of July, and the average annual rainfall.

Station.	For July, 1932.	To end July, 1932.	Av'ge to end July.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	—	3·18	3·00	4·75
Marree	0·05	3·73	3·47	5·93
Farina	0·16	3·75	4·07	6·48
Copley	0·18	4·05	4·93	7·95
Beltana	0·30	4·26	5·19	8·59
Blinman	0·77	4·66	7·34	12·00
Hookina	0·39	6·02	6·84	11·42
Hawker	0·70	7·90	7·23	11·42
Wilson	0·81	7·64	6·90	12·23
Gordon	0·37	5·75	6·17	10·69
Quorn	1·15	8·24	7·53	13·35
Port Augusta	0·85	8·61	5·51	9·42
Bruce	0·71	6·22	5·52	9·90
Hammond	0·70	9·20	6·32	11·33
Wilmington	1·42	10·84	10·06	17·50
Willowie	1·04	9·42	6·86	12·16
Melrose	2·91	19·46	13·44	12·16
Booleroo Centre	1·84	13·64	8·57	15·20
Port Germein	1·63	13·93	7·08	12·45
Wirrabara	2·76	18·84	10·89	19·27
Appila	1·85	13·03	8·20	14·69
Cradock	0·69	6·56	6·30	19·27
Carrieton	0·76	5·48	6·97	12·35
Johnburg	0·51	5·40	5·79	10·63
Eurelia	0·84	6·23	7·26	13·06
Orroroo	1·26	7·48	7·61	13·24
Nackara	0·65	6·43	6·65	11·16
Black Rock	1·28	6·96	6·99	12·46
Oodlawirra	1·17	7·02	6·47	11·62
Peterborough	1·65	8·70	7·27	13·24
Yongala	1·92	10·50	7·78	14·44
NORTH-EAST.				
Yunta	0·46	7·76	4·90	8·43
Waukaringa	0·24	4·42	4·84	8·00
Mannahill	0·34	3·75	4·80	8·30
Cockburn	0·17	4·32	4·79	7·91
Broken Hill, N.S.W.	0·32	4·11	5·82	9·58
LOWER NORTH.				
Port Pirie	1·13	13·28	7·64	13·19
Port Broughton	1·58	9·15	8·15	13·93
Bute	2·33	12·46	9·02	15·38
Laura	2·23	15·63	9·99	17·99
Caltowie	2·41	13·06	9·10	16·74
Jamestown	2·61	13·87	9·63	17·75
Gladstone	1·78	11·77	8·93	16·32
Crystal Brook	2·14	12·39	8·91	15·81
Georgetown	2·50	13·26	10·34	18·39
Narridy	2·07	10·83	8·98	15·89
Redhill	2·92	13·60	9·42	15·56
Spalding	2·42	12·55	10·04	19·13
Gulnare	3·21	15·47	10·11	18·62
Yacka	2·56	12·20	8·54	15·32
Koolunga	2·23	10·80	8·63	15·43
Snowtown	2·25	12·68	8·91	15·62
LOWER NORTH—*continued.*				
Brinkworth	2·23	12·48	8·68	15·74
Blyth	1·82	12·65	9·47	16·76
Clare	3·44	18·90	14·04	24·54
Mintaro	2·84	15·64	12·79	23·34
Watervale	3·15	18·30	15·09	26·91
Auburn	2·88	16·70	13·62	24·00
Hoyleton	1·45	10·36	9·69	17·33
Balaklava	1·53	10·29	8·79	15·52
Port Wakefield	1·43	8·62	7·78	12·96
Terowie	1·33	9·34	7·17	13·39
Yarcowie	1·48	9·92	7·54	13·63
Hallett	2·19	13·18	8·85	16·43
Mount Bryan	2·59	13·34	9·05	16·70
Kooringa	1·98	12·11	10·06	17·90
Farrell's Flat	2·36	12·74	10·39	18·66
WEST OF MURRAY RANGES.				
Manoora	2·60	13·06	10·10	18·82
Saddleworth	3·01	14·27	11·01	19·54
Marrabel	3·05	14·40	10·98	19·83
Riverton	3·24	14·91	11·69	20·73
Tarlee	2·49	12·35	10·06	18·09
Stockport	2·52	13·82	9·23	16·80
Hamley Bridge	2·18	12·94	9·32	16·55
Kapunda	2·82	13·66	11·16	19·81
Freeling	2·06	12·81	9·94	17·87
Greenock	2·61	13·61	11·85	21·60
Truro	2·25	12·33	11·12	20·02
Stockwell	2·35	13·98	11·18	20·15
Nuriootpa	3·11	14·83	11·57	20·62
Angaston	3·24	14·87	12·58	22·43
Tanunda	3·21	14·22	12·58	22·04
Lyndoch	3·50	15·32	13·13	23·48
Williamstown	4·42	19·01	16·14	27·63
ADELAIDE PLAINS.				
Owen	1·56	9·89	7·95	14·00
Mallala	1·75	11·42	9·51	16·59
Roseworthy	2·07	12·44	9·77	17·32
Gawler	2·15	12·32	11·01	18·99
Two Wells	1·80	11·55	9·31	15·74
Virginia	2·54	12·53	10·00	17·14
Smithfield	2·64	14·41	9·96	17·42
Salisbury	2·23	14·74	10·90	18·55
Adelaide	2·64	17·18	12·66	21·09
Glen Osmond	4·28	20·67	15·52	25·95
Magill	3·42	20·41	15·20	25·49
MOUNT LOFTY RANGES.				
Teatree Gully	3·80	19·56	15·94	27·29
Stirling West	8·64	37·76	27·83	46·78
Uraidla	9·41	39·44	26·12	43·82
Clarendon	6·22	26·24	19·59	32·80
Morphett Vale	3·92	16·31	13·48	22·59
Noarlunga	3·64	15·90	12·29	20·33
Willunga	4·95	18·65	15·77	25·13
Aldinga	3·88	14·48	12·28	22·09

RAINFALL—*continued.*

Station.	For July, 1932.	To end July, 1932.	Av'ge to end July.	Av'ge Annual Rainfall.
MOUNT LOFTY RANGES—*contd.*				
Myponga	6·20	23·10	17·65	28·94
Normanville	3·86	14·14	12·69	20·67
Yankalilla	4·09	15·25	14·08	22·80
Mount Pleasant	4·55	19·18	15·57	27·21
Birdwood	5·18	22·15	16·63	29·16
Gumeracha	5·89	24·41	19·23	33·36
Millbrook Rsvr.	4·95	23·95	19·54	34·95
Tweedvale	7·58	27·99	20·78	35·83
Woodside	5·93	24·26	18·43	32·23
Ambleside	6·37	25·08	19·96	34·88
Nairne	6·26	21·92	16·17	28·13
Mount Barker	8·42	30·97	18·24	31·71
Echunga	7·16	26·69	19·40	33·14
Macclesfield	5·58	20·42	17·50	30·46
Meadows	7·10	27·30	20·89	36·10
Strathalbyn	2·35	10·87	11·15	19·35
MURRAY FLATS AND VALLEY.				
Meningie	2·93	13·63	10·87	18·42
Milang	1·68	11·30	8·83	14·96
Langhorne's Crk.	2·51	11·37	8·29	14·76
Wellington	2·07	14·37	8·24	14·58
Tailem Bend	2·56	15·05	7·89	14·61
Murray Bridge	1·54	9·18	7·63	13·68
Callington	2·75	10·17	8·51	15·25
Mannum	1·40	8·27	6·63	11·51
Palmer	2·12	11·41	8·17	15·49
Sedan	1·21	7·42	6·77	12·16
Swan Reach	0·93	7·32	5·79	10·61
Blanchetown	0·88	6·88	6·45	11·08
Eudunda	2·06	12·94	9·45	17·12
Sutherlands	1·17	7·97	5·78	10·80
Morgan	0·77	6·11	4·94	9·20
Waikerie	0·51	6·49	5·21	9·69
Overland Corner	0·68	5·40	5·74	10·47
Loxton	1·12	8·18	6·31	11·64
Renmark	0·85	6·11	5·59	10·50
WEST OF SPENCER'S GULF.				
Eucla	0·50	5·21	6·47	10·04
Nullarbor	0·70	7·42	5·72	8·66
Fowler's Bay	1·19	9·64	7·82	11·70
Penong	1·46	9·08	7·74	11·84
Koonibba	1·28	9·81	7·20	11·46
Denial Bay	1·21	7·13	8·30	10·96
Ceduna	1·27	9·17	6·03	9·75
Smoky Bay	1·41	8·68	6·44	10·20
Wirrulla	0·89	7·94	5·70	9·57
Streaky Bay	2·17	10·53	9·53	14·80
Chandada	1·20	9·15	—	—
Minnipa	1·43	10·94	8·21	13·55
Kyancutta	1·44	10·74	—	—
Talia	2·29	10·33	8·56	14·56
Port Elliston	2·68	12·93	10·32	16·34
Yeelanna	2·45	14·77	9·04	15·73
Cummins	2·99	13·42	10·03	17·46
Port Lincoln	2·88	15·76	11·84	19·37
Tumby	1·68	10·79	7·69	14·00
Ungarra	1·96	11·97	9·20	16·70
Carrow	0·93	9·22	7·00	13·10
Arno Bay	1·35	11·75	6·96	12·40
WEST OF SPENCER'S GULF—*continued.*				
Rudall	1·62	12·16	6·75	12·26
Cleve	2·23	15·13	8·33	14·62
Cowell	0·88	8·72	6·45	11·14
Miltalie	1·50	12·42	7·83	13·56
Darke's Peak	2·05	13·28	8·16	14·86
Kimba	2·37	10·75	6·78	11·53
YORKE PENINSULA.				
Wallaroo	2·00	15·08	8·58	13·90
Kadina	2·29	14·97	9·48	15·63
Moonta	1·98	13·04	9·33	15·06
Paskeville	1·46	12·78	9·04	15·52
Maitland	2·69	16·29	11·96	19·91
Ardrossan	1·31	10·52	8·13	13·95
Port Victoria	2·61	12·56	9·19	15·40
Curramulka	2·39	14·26	10·47	17·88
Minlaton	2·40	14·52	10·53	17·82
Port Vincent	2·67	11·43	8·16	14·49
Brentwood	3·05	13·29	8·94	15·44
Stansbury	2·56	12·21	9·87	16·80
Warooka	2·43	12·49	10·59	17·53
Yorketown	2·37	12·09	10·05	16·93
Edithburgh	2·51	12·77	9·74	16·36
SOUTH AND SOUTH-EAST.				
Cape Borda	3·82	18·75	15·97	24·77
Kingscote	2·72	13·97	11·78	19·10
Penneshaw	3·05	14·58	10·99	18·16
Victor Harbor	4·01	18·42	12·72	21·26
Port Elliot	2·66	14.04	11·85	19·94
Goolwa	2·40	13·74	10·65	17·81
Copeville	1·04	8·66	5·91	11·42
Meribah	1·02	9·73	6·62	11·21
Alawoona	1·27	9·43	5·83	10·02
Mindarie	1·17	11·26	5·98	11·89
Sandalwood	1·37	10·67	7·22	13·59
Karoonda	1·70	11·23	7·57	14·34
Pinnaroo	1·75	11·05	7·96	14·62
Parilla	1·57	11·04	7·42	13·91
Lameroo	2·08	11.46	8·67	16·16
Parrakie	2·23	12·66	7·63	14·51
Geranium	2·75	13·32	8·74	16·44
Peake	1·91	11·94	8·73	16·21
Cooke's Plains	1·66	15·98	8·54	15·41
Coomandook	2·28	12·87	9·53	17·22
Coonalpyn	3·05	15·47	9·82	17·44
Tintinara	3·30	15·42	10·45	18·70
Keith	2·53	12·52	9·94	17·91
Bordertown	2·32	14·46	10·79	19·32
Wolseley	2·44	15·14	10·16	18·44
Frances	2·32	13·28	10·91	20·03
Naracoorte	2·90	16·92	12·75	22·62
Penola	2·50	16·68	14·79	26·14
Lucindale	3·76	19·46	13·45	23·11
Kingston	3·97	16·69	14·85	24·33
Robe	5·12	19·60	15·38	24·65
Beachport	6·53	23·67	17·13	27·01
Millicent	4·07	21·78	18·08	29·81
Kalangadoo	4·19	26·65	18·20	32·30
Mount Gambier	4·86	22·12	17·71	30·64

AGRICULTURAL BUREAU REPORTS.

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Branch.	Report on Page.	Dates of Meetings.		Branch.	Report on Page.	Dates of Meetings.	
		Aug.	Sept.			Aug.	Sept.
Alawoona	†	—	—	Eurelia Women's	†	3	7
Aldinga	*	—	—	Everard East	*	—	—
Allandale East	†	12	9	Farrell's Flat	*	26	30
Alma	*	—	—	Finniss	†	—	—
Amyton	*	—	—	Frances	*	—	—
Angaston	*	—	—	Gawler River	*	—	—
Appila	*	—	—	Georgetown	*	13	10
Appila-Yarrowie	†	5	2	Geranium	*	27	24
Arthurton	*	—	—	Gladstone	*	12	9
Ashbourne	†	10	14	Gladstone Women's	†	12	9
Auburn Women's	*	27	—	Glencoe	*	9	13
Balaklava	*	—	—	Glossop	*	—	—
Balhannah	†	—	—	Goode	*	17	14
Barmera	*	—	—	Goode Women's	*	17	14
Beetaloo Valley	†	15	12	Greenock	107	25	—
Belalie Women's	91	9	1	Green Patch	111	11	15
Belvidere	†	—	—	Gulnare	*	—	—
Berri	*	17	14	Gumeracha	†	15	12
Big Swamp	*	—	—	Halidon	*	—	—
Blackheath	†	18	15	Hanson	*	16	13
Black Rock	*	—	—	Hartley	†	—	—
Black Springs	†	16	13	Hawker	*	—	—
Blackwood	*	8	12	Hindmarsh Island	†	—	—
Block E	*	—	—	Hookina	*	—	—
Blyth	†	26	23	Hoyleton	†	15	19
Booleroo Centre	*	12	9	Inman Valley	†	18	15
Boolgun	*	—	—	Ironbank	*	—	—
Boor's Plains	109	4	—	Jamestown	*	22	26
Borrika	*	—	—	Jervois	†	11	8
Bowhill	†	15	12	Kalangadoo Women's	†	13	10
Brentwood	*	4	1	Kalangadoo	*	13	10
Brinkley	*	10	14	Kalyan	115	17	21
Brinkworth	†	15	12	Kangarilla	†	—	—
Brownlow	†	—	—	Kangarilla Women's	†	18	15
Buchanan	†	—	—	Kanmantoo	*	—	—
Bugle	*	9	13	Kanni	†	—	—
Bundaleer Springs	*	—	—	Kapinnic	*	19	16
Bunora	*	16	—	Kapunda	*	12	9
Bute	*	18	15	Karcultaby	*	—	—
Butler	*	—	—	Karoonda	*	17	14
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Canowie Belt	*	—	—	Kongorong	†	15	12
Caralue	*	10	14	Koolunga	*	—	—
Carrow	*	10	14	Koonibba	*	11	8
Chandada	*	—	—	Koonunga	*	—	—
Charra	*	—	—	Koppio	†	16	13
Cherry Gardens	†	—	10	Kringin	*	15	12
Clanfield	*	—	—	Kulkawirra	†	9	13
Clare	*	2	—	Kyancutta	112	2	6
Clare Women's	92	—	—	Kybybolite	*	11	15
Clarendon	*	15	12	Lameroo	*	13	10
Cleve	*	6	3	Langhorne's Creek	†	10	14
Cobdogla	*	—	—	Laura	*	13	17
Collie	*	3	7	Laura Bay	†	—	—
Colton	*	—	—	Lenswood and Forest Range	†	—	—
Coomandook	†	25	29	Light's Pass	*	—	—
Coonalpyn	*	—	—	Lipson	*	13	10
Coonawarra	*	18	15	Lone Gum and Monash	*	10	14
Coorabie	*	—	—	Lone Pine	*	15	12
Copeville	*	—	—	Longwood	†	—	—
Coulta	*	—	—	Lowbank	*	10	14
Cradock	*	—	—	Loxton	*	12	9
Cummins	*	12	9	Lucindale	*	—	—
Cungena	†	4	1	Lyndoch	*	16	13
Currency Creek	116	15	12	McLaren Flat	*	—	—
Cygnet River	*	—	—	McLaren Flat Women's	92	4	1
Darke's Peak	*	—	—	Macclesfield	†	18	15
Dudley	*	—	—	MacGillivray	*	16	13
Edillilie	*	—	—	Mallala	*	15	19
Elbow Hill	†	16	13	Maltee	†	11	15
Eudunda	*	1	5	Mangalo	*	—	—
Eurelia	†	13	10	Mannanarie	*	—	—
				Marama	*	—	—

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Millicent Women's	†	—	—
Miltalie	†	—	10
Mindarie	*	5	2
Minnipa	*	—	—
Modbury	*	10	14
Monarto South	†	—	—
Moonta	*	—	—
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Moorook	*	—	—
Morchard	*	12	9
Morphett Vale	*	—	—
Mount Barker	†	10	14
Mount Bryan	†	—	—
Mount Compass	118	4	1
Mount Gambier	†	12	9
Mount Hope	*	9	13
Mount Pleasant	†	—	—
Mount Remarkable	*	—	—
Mount Schank	*	—	—
Mudamuckla	*	13	10
Mundalla	101	—	—
Murray Bridge	*	—	—
Murraytown	†	—	—
Mypolonga	*	—	—
Myponga	118	18	15
Myrla	*	10	14
Nantawarra	*	11	15
Naracoorte	*	13	10
Narridy	†	—	—
Narrung	*	—	—
Nelshaby	*	—	—
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Netherton	†	10	14
New Residence	*	—	—
North Booborowie	*	—	—
Nunjikompita	*	11	15
Nunkeri	*	10	14
O'Loughlin	*	8	12
Orroroo	*	—	—
Overland Corner	†	10	14
Owen	*	12	9
Palabie	†	—	—
Parilla	†	2 & 30	27
Parilla Women's	*	17	21
Parilla Well	*	16	20
Parilla Well Women's	†	16	20
Parrakie	*	—	—
Parrakie Women's	†	22	26
Paruna	116	5	2
Paskeville	†	16	13
Pata	*	5	2
Penneshaw	*	—	—
Penola	†	6	3
Penola Women's	†	—	—
Penwortham	108	11	15
Petersville	*	16	13
Petina	*	27	24
Pinbong	†	—	—
Pinkawillinie	*	—	—
Pinnaroo	†	—	—
Pinnaroo Women's	†	5	2
Port Elliot	†	—	—
Pygery	†	16	13
Quorn	*	—	—
Ramco	†	15	12
Rapid Bay	*	—	—
Redhill	†	—	—
Rendelsham	*	16	13
Renmark	*	—	—
Rhynie	*	—	—
Richman's Creek	*	11	15
Riverton	*	8	12
Riverton Women's	*	—	—
Roberts and Verran	†	—	—
Rosedale	†	16	20
Roseworthy	*	—	—
Rosy Pine	*	—	—
Rudall	*	9	13
Saddleworth	*	19	16
Saddleworth Women's	*	2	6
Salisbury	*	—	—
Salt Creek	*	—	—
Sandalwood	*	—	—
Scott's Bottom	*	12	9
Shoal Bay	119	16	13
Smoky Bay	*	—	—
Snowtown	†	12	9
South Kilkerran	†	16	13
Spalding	*	—	—
Springton	†	3	7
Stirling	*	—	—
Stockport	†	—	—
Strathalbyn	*	—	—
Streaky Bay	*	26	23
Tailem Bend	*	18	22
Talia	*	26	30
Tantanoola	*	6	3
Tantanoola Women's	†	3	7
Taplan	†	9	13
Taragoro	113	11	15
Tarcowie	*	—	—
Tarlee	*	16	20
Tarpeena	*	—	—
Tatiara	*	—	—
Thrington	*	—	—
Tintinara	†	—	—
Truro	†	8	12
Tulkineara	*	18	15
Tweedvale	*	18	15
Two Wells	*	—	—
Ungarra	*	18	22
Upper Wakefield	†	11	15
Uraidla and Summertown	*	1	5
Veitch	*	—	—
Virginia	*	—	—
Waddikee Rocks	†	13	10
Waikerie	*	12	9
Wallala	*	10	14
Wanbi	*	24	28
Wandearah	*	16	13
Warcowie	†	16	13
Warcowie Women's	93	—	—
Warramboo	†	16	13
Wasleys	†	11	8
Wasleys Women's	†	4	1
Watervale	*	15	19
Wauraltee	†	16	13
Weavers	†	8	12
Wepowie	104	2	5
White's River	*	9	13
Whyte-Yarcowie	*	—	—
Wilkawatt Women's	*	—	—
Williamstown Women's	94	3	7
Williamstown	*	—	—
Willowie	*	22	26
Wilmington	†	16	20
Windsor	*	—	—
Wirrabara	†	—	—
Wirrilla	†	13	10
Wirrilla Women's	*	R	2
Wirrulla	*	17	21
Wolseley	*	8	12
Wudinna	†	—	—
Wynarka	*	—	—
Yacka	*	—	—
Yadnarie	†	16	13
Yallunda Flat	*	—	—
Yandiah	107	12	9
Yaninee	*	—	—
Yantanabie	*	—	—
Yeelanna	*	10	14
Yorketown	*	—	—
Younghusband	*	—	—
Yurgo	†	—	—
Yurgo Women's	†	—	—

* No report received during the month of July. † Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

WOMEN'S BRANCHES.

INQUIRY DEPARTMENT.

[*Replies supplied by* MISS E. CAMPBELL, *Dip. Dom. Econ., Education Department.*]

Penola—"What is the best method to soften hard water for household purposes?"

By means of a mechanical water softener a continuous supply can be obtained. These appliances cost from £15 to £40 according to the capacity and to the state of hardness of the water. The method that was used in years gone by was to expose the water in open tanks and allow the air to cause the minerals to settle at the bottom of the tank, or a tub could be used. This method is the best, but it takes time, and there is the difficulty of drawing off the water without disturbing the sediment. For smaller quantities of water, boiling will cause the minerals to be precipitated. They will then form a crustation on the kettle or saucepan. For laundry purposes, there are various chemicals that can be added, such as borax, soda, ammonia, an excess of soap, but care should be exercised, as the soda, ammonia, and excess of soap will destroy the color of materials.

Belalie—"What is a coddled egg?"

A coddled egg is a very lightly cooked egg. Have the water boiling in the saucepan, place the egg in the water, put the lid tightly on the saucepan, and remove it from the stove. Allow the egg to remain in the saucepan whilst the water is cooling, and then the egg will be very lightly set. An average egg takes about five to seven minutes.

Belalie—"How to make oatmeal jelly?"

A clear jelly cannot be made from oatmeal on account of the starch it contains. The following is a recipe which makes a very tasty mould:—

Ingredients.—One tablespoon oatmeal, ½ pint cold water, pinch salt, ½ teaspoon sugar.

Method.—Soak the oatmeal in the cold water for half an hour; then stir well and strain through a fine strainer to remove all the husks. The husks are discarded. Add the salt and sugar to the liquid and bring it to the boil, stirring well. Simmer for eight to 10 minutes, stirring occasionally. Pour into wetted mould and allow to set, when it will turn out easily. A little nutmeg or cinnamon may be added to the liquid before it is brought to the boil, but this will flavor and color the mixture, and the mould will not be quite so clear.

Kangarilla—"What makes split peas remain hard in soup?"

Peas contain a lot of starch, and when they are dried, as for split peas, the starch cells become very hard. If the split peas are well covered with cold water and allowed to soak over night, they will become quite soft, and the water in which they have been soaking should be used in the soup.

Kangarilla—"Would it harm a child to eat raw vegetables, including potatoes, cauliflower, marrow? Child will eat any sort of vegetables raw, but will not eat them cooked.

No; it does no harm to eat raw vegetables, but they should be thoroughly washed and well masticated. If swallowed in large pieces they may cause digestive troubles. It seems as though the child's system is requiring the mineral salts. Try not to overcook the vegetables, thus preserving their full value, and always drain them well before serving.

Kalangadoo.—*What is the cause of hard butter, and a remedy to correct this fault?* The Chief Dairy Instructor (Mr. H. B. Barlow) says:—"Hard butter may be due to several causes, of which cold weather and the type of food available are the chief. Cows in an advanced stage of lactation are also more likely to give a firmer butter. With farm butter, the usual cause of the butter being hard and brittle in cold weather is that it is not worked sufficiently. Owing to the fact that factories are able to control the churning temperatures they work the butter for from 35 to 45 hours, and thus obtain what may be termed a 'spreadable' butter. Work the butter as much as possible after churning, allow it to set over-night, and then re-work until soft and almost greasy. This will have a decidedly beneficial effect. If only one or two cows are kept the addition of about 1lb. of linseed meal to the feed will probably assist in giving a softer fat, and will at least be beneficial to the cows."

BELALIE (Average annual rainfall, 17.75in.).

June 14th.

The meeting held on June 14th took the form of an exhibition of ancient and modern work. It was well patronised by visitors and members. There was a wonderful display of ancient articles. Three samplers were worked in 1701, 1790, and 1818 respectively, whilst a snuffbox which had once been in the possession of Sir Francis Drake and a tiny piece of brocade from a lady's dress took one back to the reign of Queen Elizabeth. Silver spoons over 200 years old, original willow and mason pattern plates, sixteenth century candlesticks, a small teacup as used in 1700, a seventeenth century goblet, a carpenter's morticing gauge 200 years old, ancient jewellery and books, were particularly interesting. Articles from Japan, China, India, New Zealand, and Siam gave an idea of the arts practised in other lands. Some wonderful hand-woven linen was also displayed; one linen sheet had been woven in County Clare, Ireland, 150 years ago, and a pair of blankets which had been hand woven in Scotland 100 years ago and used constantly. An interesting exhibit was a picture made of wool flowers, which had been made by two sisters in Jamestown over 40 years ago. Competitions were also held for the best and most interesting articles made in the home, not to exceed more than four articles. There were 12 entries and a great variety of useful and interesting articles. The most beautiful was a large rug made from blue and grey flannel, which was a work of art. Other collections contained knitted articles, fancy needlework, dressmaking, mats made from cast-off clothing, preserves, home-made toys, sweets, bread, soap, leather work, chip carving, and painting. The winning exhibit consisted of a beautiful hand-knitted cardigan, tapestry firescreen, stained book ends in wood, and a leather book cover. The second prize exhibited a lovely carved table, painted picture, crochet trimmed nightdress, and home-cured ham. The exhibition was in every way a success, and was appreciated by all who attended. (Secretary, Mrs. F. Cummings, Jamestown.)

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CLARE (Average annual rainfall, 24.54in.).

June 4th.—Present: 12 members and four visitors.

Dress Cutting and Fitting.—The following paper was read by Mrs. A. Rogers:—"The first thing to do when cutting out a dress is to determine the right side of the material. If there is a pronounced diagonal weave, as in serge, hold the material against you and use the side with the twill passing from left to right. When the warp and woof are square in appearance, as in hopsack, linen, and plain silk, hold up to the light and use the smoothly finished side. When looking down on velvet the dark side must face upward. Measure the figure accurately and just large enough, and when cutting allow an inch or two where plenty of freedom is required. Then allow for all turnings. It is necessary to make a pattern or else procure one. A good plan is to save a plainly fitted dress, and when worn out cut a pattern from it and almost any style can be worked up. Keep to the straight of the material as far as possible. It is easier to cut from plain and small designs than stripes. Careful and thoughtful cutting is time saved at the end of the work. A design for a plain home frock is one with the top cut to the hip line, with a double inverted pleat at either side of the skirt and a belt at the waist, with full length, plain sleeve. The surest way of cutting is to place all pieces of the pattern on the double of the material. Cut all the large pieces of the pattern, taking thought for collars, cuffs, facings, and other small parts, but cut these after a preliminary fitting. Before pinning the pattern together, mark the centre line with contrast cotton without making a knot. The only time a knot is needed is in a thread for gathers. Proceed with fitting by placing the back and front on the figure with the centre line well placed. Fit the shoulder seam, taking out all the pins if not quite satisfactory. Then smooth upwards, having the front taut and the back eased in a trifle. This seam should be well over the shoulder line, and will help to make the back appear straight. The under-arm seam often needs the front piece either raising or lowering according to the demands of the figure, while a dart at the bust line would be an improvement. Care must be exercised with the armhole. Have it comfortably fitted but not too large. The sleeve needs to be rather larger than the armhole, and if eased in will set satisfactorily. If the shoulder seams are well fitted the collar should present no difficulty. Pin the centre of collar to the centre of the back, and if "worked in" a trifle in the middle of the back will be quite comfortable. The skirt must have the side seams shaped and the pleats placed parallel. Put the pleats in before fitting the seams, being careful that the size at the top of the skirt exactly corresponds to the hip-fitting of the dress. Having fitted one side, take all pieces apart. Rectify the fitting by placing the corrected half on the other and cutting the two alike. The length of the dress is the last thing to arrange, although the full length measurement is decided at the beginning, but by leaving the hem until last a little more or less can be put in it." (Secretary, Mrs. Rogers.)

McLAREN FLAT.

June 2nd.—Present: 17 members.

Duck Raising.—Mrs. J. Bruce contributed the following paper:—"The provision for duck breeding need not be so elaborate as in the case with fowls. It is always necessary to have shade for ducks and ducklings. A place made of wire netting, not too high and covered with straw, will make a good shade in their yards, and ducks as a rule disdain a house, but like a sheltered spot in which to camp. Any cool, but dry, spot will serve as a breeding, laying, or rearing house, but the nest must be dry. It is advisable to see that the nests are a little above the ground level. Heavy breeds require a pond, say, 12in. deep. It should be in a separate enclosure to be under control. Young ducklings do not require water to swim in; they must be kept as dry as possible, snug, but not overcrowded, and provided with fresh air. One main essential to success is to keep plenty of fresh water in the water vessels day and night. These should be in one corner of the yard and always kept filled. Ducks must always be watered before they are fed, and watered at least three times a day. The water vessels must be deep enough to allow the birds to dip their heads, otherwise bad eyes often develop. The plan is sometimes adopted of putting a brick in the vessels or cyclone wire over them so that the ducklings cannot get drowned. Young ducklings need not be left with their mothers many weeks. They can be put into a house by themselves, but they must be sheltered from the cold or heat and have dry sleeping quarters, with plenty of dry straw. If one is handling, say, 50 birds, it is advisable to divide them into sizes and put them in separate houses. One part of bran and two parts pollard, and double the quantity of finely chopped greenfeed mixed with it and fed three times a day or more if wanted, will be found suitable. As soon as the ducklings are feeding well, a little meat meal can be added to their other food, say, 1lb. per 100 birds. Wheat and barley meal are sometimes used. The Pekin duck has proved most satisfactory in Australia; it is suited for export trade and sells well in England. White ducks are better for table use. Muscovy ducks are the best table birds; they carry plenty of meat, some of the drakes weighing as much as 14lbs. and the ducks about 7lbs. They are easily bred. See that good, dry nests are made for them. The eggs take from 34 to 35 days to hatch. Only ducks two or three years old should be mated with the best procurable drakes. Keep the yards and houses clean and dry; clean out all rubbish and put clean sand all over the yard. A plentiful supply of shell grit, charcoal, or coarse sand will assist in keeping the birds healthy. Ducks are expensive to feed, and at ruling prices it does not pay to rear them. At present ducks are cheaper than butcher's meat. Ducks can be easily plucked if scalded with plenty of water and then wrapped in a bag for 10 minutes. Up to 20 hen eggs can be set under a duck, but the duck must not be allowed near running water when sitting on fowls' eggs.'' (Secretary, Mrs. Robertson.)

WARCOWIE (Average annual rainfall, 11.42in.).

June 17th.—Present: Eight members.

The meeting took the form of a Question Box. ''What can be done to linoleums from which the pattern has worn off to make them keep clean and not show footmarks?'' *Answer*—It is almost impossible to do this, because once the surface of the linoleum is worn it is impossible to restore it, but if the linoleum is thoroughly cleaned and then varnished with a good clean varnish it will greatly improve its appearance. If the lino. is in a very bad condition it may need two coats of varnish, but allow the first coat to dry well before applying the next. ''How to get rid of silver fish?'' *Answer*—Spray the affected places with flytox, and do this fairly often until there are no signs of the insects. ''What causes cornflour sponges to cook nicely on top and underneath form a thick, rubber-like substance? If peeled off while hot the sponge is otherwise nice.'' *Answer*—The cause of this is too cold an oven or because the papers used in the cake tins are too thick.

Mr. C. A. Goddard (School of Mines) spoke to members on the scouring of wool. (Secretary, Mrs. A. Crossman.)

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Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Victoria Square, Adelaide.

C. F. ANDERSON, Poultry Expert.

WILKAWATT (Average annual rainfall, 16in. to 17in.).

June 21st.—Present: 8 members.

HOME REMEDIES.—Mrs. A. Young read the following paper:—"To know what to do when a child becomes sick or hurt in games with other children is part of each mother's daily work. Often a child is more frightened than hurt when something unusual happens, but with a nervous child the shock has a worse effect than the actual hurt. A cough, cold, bad headaches, or pains in any part of the body if treated at once by a simple remedy is usually curable, but if left unchecked for any length of time may cause a very serious setback to the child. Should the home remedies not prove effective, it is not advisable to wait too long before consulting a doctor. Irritability is mostly a sign of ill-health, and it is mother's "job" to think out the cause. Perhaps an unbalanced menu has caused constipation or it may be over excitement with insufficient sleep. Plenty of sleep for the growing child cannot be too much emphasised. One trouble in children which could almost come under the heading of maladies is shyness. Great care and gentleness is needed with children who suffer from it. Shy children should never be bullied into doing things, but if they are made to realise that their help is needed to make things a success in helping others, they forget themselves. Always remember the proverb, "Prevention is better than cure;" make the body strong so that there will be plenty of strength to resist disease. If a child needs a tonic, cod liver oil or extract of malt are both good. For constipation, 1lb. of dates minced with 1oz. of senna leaves is excellent, and children take it readily. For eruptions of the skin, ½lb. of sulphur mixed into 1lb. treacle and given freely to children is good. A few drops of eucalyptus in 1 tablespoonful of olive oil rubbed on throat and chest is good for coughs and colds and also for aching limbs, bumps, and bruises. For a scald, the white of an egg (not beaten) applied on a bandage will give instant relief and prevent a blister. *Cough Mixture.*—Boil together 2 cups treacle, 4 cups water, skim and stand until cold. Get from chemist threepennyworth each of aniseed, paragoric, ipecacuanha wine, peppermint. Shake well and put with boiled mixture, bottle. This mixture will keep for months." (Secretary, Mrs. W. Pritchard.)

SPECIAL SESSION FOR WOMEN AT JABUK CONFERENCE.

Delegates and visitors to the number of 72 attended the Special Sessions held for women at the Jabuk Conference in August. Mrs. White and Mrs. Cabot, of the Parrakie Branch, acted in the capacity of President and Secretary respectively.

Addresses were delivered by Miss E. Campbell (Dip. Econ.). of the Education Department, and Messrs. H. B. Barlow and C. F. Anderson, of the Department of Agriculture.

The following papers were read and discussed:—

COMFORTS MADE FROM WOOL PREPARED ON THE FARM.

[By Mrs. WHITTLE, Pinnaroo.]

Take a well woolled sheep skin as soon after killing as possible, lay it out—wool side down—and from the back cut out eight or ten square pieces. Steep these in cold water in which a little soap or soap powder has been dissolved the night previous to the weekly wash day. Wash the pieces well with soap in the last warm rinsing water, blue, then rinse in clear water. If dried with the blue water in the wool it is likely to have slightly stained tips. Hang out to dry, stretched as straight as possible. When dry, clip the wool off close to the skin and spread on trays in a cool oven for half an hour or so. When teased out a little, this makes an excellent filling for pillows, cushions, mattresses, &c.

For eiderdowns and fine quilting, such as dressing gowns, matinee jackets, &c., comb the wool with a fairly wide toothed comb as it is clipped off; the pieces cut from the shoulders are the most suitable for this finer work. The shorn pelt—if slightly tanned—**has many uses, such as a triangular** piece laced over a worn floor polishing mop, **a half circle stitched round and wool filled used as a kneeling pad for floor washing, gardening gloves, and** children's slippers—these are a few of its many uses.

HOME CLEANING AND POLISHING.

[By Mrs. E. J. Sands, Pinnaroo.]

Start the day by pushing the doors and windows wide open, curtains back, and bed tossed up ready to air, then as soon as breakfast is over the rooms are ready for attention.

Washing the dishes is made very easy with a dish mop, hot water, and soap. **A brush** for glass dishes, to brush out all the patterns which are stamped on them. **A separate dish** is needed for silverware with a large flannelette towel to dry it, **give each** piece **a good rub** and it will save a lot of plate polish and give the silver **a soft, smooth** finish.

Always protect beds, cushions, bowers, plants, and ornaments whilst the rooms are being swept. Flowers and pot plants should be removed. Cover as much of the furniture as possible with a dust sheet, made from any patched old sheet. Wash the floors with soap dissolved in hot water, with a few drops of kerosene and phenyle. Kerosene keeps the hands soft, and phenyle is a good disisfectant.

Mirrors washed with whiting in the water will be quite bright if flies are a nuisance; rub, after polishing with kerosene, on a duster. Washing coppers can be cleaned with half a cup of kerosene rubbed around the copper with sheets of newspaper. Rub with

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sheet after sheet of newspaper until the copper is quite bright. The blue water will be much easier to manage on washing day if a dipper full of hot, soapy water is added before the blue. Starch will be less likely to form a skin on top if some cold water is added as soon as the starch is made.

If a petrol iron is used, strain the petrol between two thicknesses of silk. Damp the articles ironed with hot water, and they will be ready to iron almost immediately. Coffee with milk stains can be removed with pure glycerine. Brush the glycerine on the spots, wash in warm water, and iron with a warm iron.

To clean a leather coat, wash it over with saddle soap, then paint over with a medium solution of Condy's crystals, and rub over with the white of an egg, then with a dry, soft cloth. Spirits of camphor will remove most marks from polished wood, followed with some good furniture polish on a piece of soft silk. A porcelain sink can be cleaned with flannel dipped in kerosene rubbed on until all stains are removed. Aluminium saucepans should be rubbed well with sand soap. Never scrape or use soda to clean them.

HOME RECIPES.

Mop Oil.—1 cup new linseed oil, 2 cups kerosene; shake well together.

Kitchen Cleansers.—(1) 1 cake Velvet soap, 1 cake sanoper soap, 2 pints water; cut up soap, boil until all the lumps are dissolved. (2) 4ozs. fine sand, or part ashed, 4ozs. salt, 4ozs. whiting, 4ozs. extract of soap; sift together. (3) 2 packets of soap extract, 1 pint of boiling water; 1 bar of sanoper, dissolved together.

Floor Polish.—About 2ozs. beeswax, shredded into 1 pint turpentine, and left for a few days, will make a good floor polish.

Lino Polish.—1lb. beeswax, 9 cups water, 1 quart turpentine, 2ozs. potassium carbonate. Shred beeswax, put with water and potassium into an old saucepan, heat until wax is melted. Do not boil. When cool, stir in turpentine; stir occasionally until thick.

Furniture Polish.—½ pint linseed oil, ½ pint turpentine, ¼ pint methylated spirits, ¼ pint vinegar. Bottle and cork well; shake before using.

Cloudy Ammonia.—2ozs. pure ammonia, 1 pint water, small piece of soap, 1 teaspoon borax. Bottle and cork; shake well before using.

THE VALUE OF LITERATURE IN THE HOME.

[By Mrs. DOWD, Pinnaroo.]

In many homes in the country, and perhaps in the town, one will not find a book—even the daily paper is not taken. A weekly paper occasionally will find its way in. Children, in that home, are not encouraged to read, and in later life novels by doubtful authors, not fit for adults, find their way into the hands of children, because they have not learnt to love and value good literature. A parent can choose a book, and read perhaps a chapter a day to her child, and there are very few children who do not ask for a story on going to bed, and quite a lot of good story books are written. The parent will get as much enjoyment herself out of these stories as the child. When the child grows older and can read—if the parent has not the time to read and choose all his books—for the small sum of 3s. 6d. a year, he can join the Juvenile library in his district—and most libraries have Juvenile books. For that subscription he is entitled to three or four books a week. They have been read by a reading committee and approved of by that body, before being placed on the shelves, and will be all good and suitable books. "Alice in Wonderland" appeals to the youngest child, and can be understood. "No. 1 and No. 2 Jay Street Adventures in Fairyland," by John F. Macpherson; such authors as Doris Pocock, Ethel Turner; The Anne Books, by L. M. Montgomery: "Anne of Avonlea," "Anne of the Islands," "Anne of Green Gables;" Girl Guide Books, School Stories by Ethel Talbot, May Wynne, and quite a lot of other authors are suitable for girls. Books for boys will include "Pirates," by F. G. Bullen; Luke Allen's Detective Stories, School Books by A. N. Malan, Boy Scout Books, George Durston, Adventure Stories by Tom Ellis and Herbert Strang. Mrs. Herbert Strang also writes a good book for girls.

As the children grow older they will subscribe to the Public Circulating Library, and by their books being well chosen in childhood, will know the good books, and will take home books to broaden their minds on some particular subject. People and places that one will never see become familiar through reading about them. It broadens the mind, and provides something for discussion. A child that has been educated in this way in the home, and in the value of literature from infancy, will very seldom get into bad company and trouble. He has been taught to choose his companions through reading of honorable men and women, and is quite content to read and study, whilst others, who have not had this education in the home, will get into trouble and cause their parents much anxiety.

There are many Australian authors with whom all should be familiar. Between 1880 and 1900 there sprang up a school of young Australian writers, who told their own life in their own natural way. The best known writers of that school are A. B. Patterson and Henry Lawson. Between them they sum up the greater part of bush life and bushmen's aspirations. Patterson—his heroes are horse lovers—whose memory recalls the bush at its best, the drover singing behind his stock. Lawson's bushmen are a different class, and the sunlit plains are to them a waste, "where all day long in the heat and dust, when summer is on the track, with stinted stomach and blistering feet, they carry their swag outback."

Edwin Brady did for the shipping folk, and Edward Dyson for the miners, what Patterson and Lawson did for the men who handle cattle and sheep. Since 1900 there has been a marked change in the tone of Australian literature, though from the Lawson and Patterson school sprang "The Sentimental Bloke," of C. J. Dennis; the Australian Irish, "Boree Log," of John O'Brien—both worthy writers. Hugh McCrae stands out for distinction. David McKee Wright, too, is genuinely a poet. Two women writers—Mary Gilmore, the more poignant, and Lora Cross, the more passionate. A third—Dorothy Mackellar—will live by virtue of one poem, "My Country."

The output of prose fiction since 1900 has been great. Among the notables are Steel Rudd's "On Our Selection" and Mrs. Gunn's delightful annals of the Northern Territory, "We of the Never-Never."

HOOK MATS MADE FROM WASTE MATERIAL.

[By Mrs. R. C. KERLEY, Parilla.]

The materials used for this work are sugar-bags, old cardigans, stockings or any soft worn-out material, and a steel crochet hook, the largest size obtainable, or one made from a piece of fencing-wire. Wash all the material and dye it the desired color. Cut into strips from ¼in. to 1in. in width (according to the thickness of material being used) so that it will pull through the foundation easily.

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MEAL
FOR COWS, PIGS & POULTRY

From a sugar-bag cut it the size and shape required. Tack down all the rough edges, then mark the design distinctly on to the sugar-bag. Place the strips of material under the foundation and pull through with the steel hook to about ½in. high. Continue this method as close as possible, working the colors into the pattern as desired. When the whole of the foundation is covered, clip off with sharp scissors. These clippings can be saved for filling mattresses, cushions, &c. Line these mats with hessian or sugar-bags. If desired, a fringe can be made of wool on each end of the mats. Always start at the centre and work outwards; this makes the work much easier to handle.

PUFF PASTRY.

[By Mrs. C. BROWN, Parilla.]

When making puff pastry, everything must be kept cool and made as far away from the kitchen fire as possible. The oven must be the correct temperature; if too hot the fat will ooze out, and if not hot enough the pastry will not rise as it should. To test the oven, sprinkle a pinch of flour on the tray, close the door, and count 30 slowly; open the oven, and if the flour is a nice golden color, the heat will be right. Pastry should be mixed with just enough cold water to make a nice pliable dough, and it should not be too moist nor too dry. *Ingredients.*—12ozs. plain flour, 12ozs. margarine, or 6ozs. each of butter and lard, cold water to mix, and a pinch of salt. *Method.*—Sift flour and salt into a large basin, and with a knife mix with the cold water into a nice dough. Turn out on to floured board—a marble slab if possible—roll out fairly thin, always rolling from you. Divide the fat into three portions; place one portion on dough, fold into three towards you, and then roll out thinly. Leave for 10 minutes, and place on second portion of fat, fold and roll as before. Leave again for 10 minutes, then place on third portion of fat, fold and roll again as before. Leave for another 10 minutes, then fold in three and roll three times more, rolling the last time to thickness required.

RECIPES.

Jam Tarts.—Roll pastry out to about ½in. thick, cut out with tart cutter, glaze with beaten egg, and bake 10 minutes.

Maracoon Tarts.—Roll out some pastry fairly thin and line some pattytins with it, then place 1 teaspoonful raspberry jam in bottom of each, then fill with the following mixture:—4 tablespoonfuls cocoanut, ¼ cup sugar; mix well with 1 beaten egg.

Banbury Tarts.—Roll pastry fairly thin, spread the following mixture on one half, fold the other half over, wet edges and press together; roll lightly with rolling-pin, glaze with egg and sprinkle with sugar. Mark into squares, and take 10 to 15 minutes. Mixture for filling—Mix well ½lb. currants, ¼lb. sugar, 2ozs. chopped peel, 2ozs. butter, and 1 teaspoonful cinnamon.

Jam Turnovers.—Roll pastry fairly thin, cut into rounds with small saucer. Place a spoonful of jam in centre of each and fold the three sides over towards centre, making a triangle shape. Glaze with egg and sprinkle with sugar. Bake about 10 minutes (Mrs. Brown exhibited tarts, &c., made with margarine.)

THE USE OF LEMONS.

[By Mrs. F. W. GRAVESTOCKS, Parrakie.]

The housewife will find lemons very useful in many ways in the kitchen, especially in summer, when a cold lemon drink is very acceptable. A hot lemon drink in winter is also enjoyable, and as a medicine they are unsurpassed. The juice of three lemons "undiluted" and without sugar will generally stop vomiting, and for weakness after sickness a patient will be able to take—and also keep down—a tablespoonful of brandy and the juice of a lemon. The juice of a lemon added to the blue rinsing water when washing white silk will keep the silk pure white instead of turning yellow. A few slices of lemon added when boiling clothes helps to keep them white. Stains on the hands can be removed by rubbing with lemon. When aluminium pans become black and dull, clean them with a soft cloth dipped in lemon juice; rinse in warm water.

To freshen stale vegetables, soak them for one hour in cold water to which the juice of a lemon has been added. When cooking prunes, add the juice and rind of half a lemon. To remove iron rust quickly and easily from any material, invert a medium-heated iron, place on it the stained fabric, and gradually squeeze the juice of a lemon on the stain. The mark will be carried off with the steam. For removing verdigris from a copper, lemon is excellent. Slice three or four lemons and put into the bath water until the juice is extracted; they impart a delightful sense of freshness and cleanliness to the skin. A few drops of lemon juice on the toothbrush will keep the teeth perfectly white. Lemon juice makes an excellent substitute for shoe polish. A few drops rubbed briskly on black or brown shoes imparts a brilliant sheen. Lemon peel thoroughly dried and ground to coarse powder is very good for flavoring biscuits and small cakes, puddings, &c. A teaspoonful of spice added to a hot lemon drink will "break" a cold very quickly. After taking the drink it is advisable to go to bed immediately owing to the excessive perspiration caused. Lemon juice in hot coffee will help to relieve a headache. When washing the hair, add the juice of a lemon to the rinsing water. Lemons can be made into very nice jam and jelly, and many different kinds of jam may be improved by adding lemons or juice. Candied lemon peel can also be made. Lemons keep much better if put into a string bag and hung in a cool airy place.

1932 CALENDAR 1932

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1933 CALENDAR 1933

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● **FULL MOON.**

HANDY HINTS FOR THE HOUSEWIFE.

If in doubt about mushrooms, sprinkle the under side with salt and leave for a few minutes. Those which turn black with this treatment are wholesome; those which turn yellow are poisonous. Talcum powder will remove grease marks from delicate fabrics. If a little kerosene is mixed with aluminium paint before it is applied to a cold stove, the paint will better resist the action of hot liquid. Use thick boiled starch to paste covers on jam jars; smear over the whole of the cover when dry—it will be stiff like parchment, and so prevent the entrance of damp.

When eggs are scarce, remember that in a cake or pudding mixture 1 tablespoonful of golden syrup dissolved in ½ pint of warm milk will equal three eggs. When making starch on washing day, add 1 cupful to the blue water; it will not make the clothes stiff, but they will dry in half the time. If when making a fruit cake the top of it is patted with a wet hand after it is placed in the tin, it will not rise higher in the centre than at the sides. Blankets dry much more quickly and are softer if they are only lightly hand-wrung, pegged on the clothesline, and allowed to drip until dry. Cold tea is an excellent first-aid remedy for burns. Save the flaps from unsealed envelopes which enclose circulars, &c. Being gummed, they are handy to make small labels for containers. Do not wear gloves when cleaning garments with petrol; the spirit will cling to the hands and the skin may be badly scalded.

HOME-MADE BREAD.

[By Mrs. J. A. FERME, Parrakie.]

Having made bread continually for over 30 years, the following method has proved simple and effective. My yeast bottle was started with hop yeast, which is most satisfactory for both summer and winter. *Method.*—A small pinch of hops in a basin; pour on ½ pint of boiling water, stand until lukewarm, strain into the bottle, add 3 teaspoonfuls of sugar, and slice or grate a raw potato into it. One tablespoonful of beer will start the yeast for the first time, or a small piece of dough from a neighbour's baking or a drop of her yeast. Do not tie down the cork, and as soon as the yeast comes to a head, make the following sponge:—Take 4 sifters of flour in the breadpan, make a well in the centre, pour in the yeast and lukewarm potato water, water saved from potatoes boiled for a meal, or boil a potato for the purpose. Make a batter and lightly turn the flour from the sides over the top, sprinkle on handful of salt when risen. Mix with warm water into a fairly stiff dough, put into a warm place, well covered, to rise. In summer, cold water to mix the sponge and prevent sourness and other unpleasant odours. When the bread has risen to the top of the bread pan, take and roll small loaves between the two hands, and put into well-greased bread tins and again set to rise well. Then bake for 1 hour in a fairly hot oven. Be sure to bake well; keeping and cutting qualities depend on well-baked bread.

RECIPES.

Buns.—Take a piece of dough from the bread after it has well risen, and melt 2 tablespoonfuls of butter; add 3 tablespoonfuls of sugar, 1 egg, also a few currants or sultanas. Mix well, work into small buns, and put on a greased slide; set to rise until bread is baked. Bake quickly, then paint over with 1 tablespoonful of sugar and a drop of boiling water, while still hot.

Yeast Cake.—Add 1 cup of milk to the same mixture, also a little nutmeg, and put into a greased cake tin to rise. *Top for the Cake.*—½ cup of flour, ½ cup of sugar, and a little melted butter. Add cinnamon and crumble together; sprinkle over top of cake before baking.

Hot Cross Buns.—Ingredients.—1 pint of good yeast, 5ozs. margarine or butter, 1 teaspoonful of ground cinnamon, ½ level teaspoonful of grated nutmeg, ¼ teaspoonful (level) of ground cloves, ¼ teaspoonful (level) ground ginger, ½lb. crurants, 1 egg, 5ozs. of castor sugar, 1½lbs. of flour, ¼lb. mixed peel, ¾ pint of milk. *Glaze for Hot Cross Buns.*—6ozs. icing sugar, about 2 dessertspoonfuls of milk. ***Method.***—Sift 4ozs. of flour into a large basin, strain in yeast, mix to smooth batter, cover basin and set to rise in a warm place for about 1 hour. Meanwhile wash and pick over and dry the fruit and shred peel, sift the remainder of flour into another basin with the spices. Rub in fat, add sugar and prepared fruit, and mix together well. When the yeast mixture is ready, stir into the other prepared ingredients, adding also the beaten egg, and the remainder of the milk made warm. Mix altogether and beat well. Put the mixture in a warm place to rise until it swells to double its bulk. It will take about 2 hours. When the dough is ready, work into 36 small buns. Place the buns on lightly greased and floured baking-sheets, leaving a space between each to allow them to rise and mark a cross on the buns. Stand buns in a warm place to rise another 20 minutes or until double their size. Put them into a fairly hot oven to bake for about 20 minutes. Brush over the hot buns with the glaze and put back into the oven for 1 minute to dry.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Pinnaroo	3/6/32	18	" Woollen Comforts," Mrs. Whittle	Mrs. F. Atze
Eurelia	1/6/32	—	Dance in aid of Orroroo Hospital	Mrs. I. Wall
Eurelia	29/6/32	18	Address—Miss Campbell .	Mrs. I. Wall
Tantanoola	29/6/32	12	Annual Meeting	Mrs. E. Telfer
Warcowie	6/7/32	7	Address—Miss Campbell .	Mrs. A. Crossman
Nelshaby	16/6/32	17	Debate	Miss A. Lawrie
Clare	2/7/32	20	Annual Meeting	Mrs. A. Rogers
Parrakie	28/6/32	16	" Lemons and their Uses," Mrs. Gravestocks	Mrs. M. Cabot
Williamstown .	6/7/32	7	Annual Meeting	Mrs. A. Cundy
Wasleys	7/7/32	31	Address—Miss F. Barnett	Miss G. George
Pinnaroo	1/7/32	14	Mrs. E. Nietz—" Milk Testing "	Mrs. F. Atze
Nelshaby	14/7/32	—	Annual Meeting	Miss T. Franks, Port Pirie
Tantanoola	6/7/32	35	Pruning Demonstration—H. H. Orchard	Mrs. E. Telfer
Tantanoola	13/7/32	—	Social	Mrs. E. Telfer.

SOUTH-EASTERN.

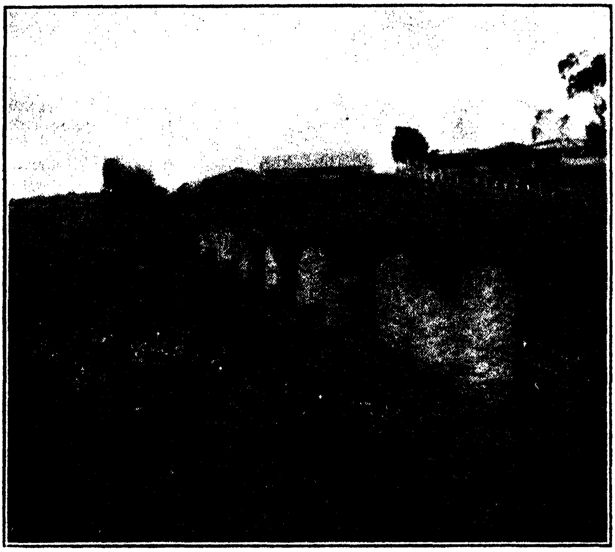
MUNDALLA (Average annual rainfall, 19.09in.).
June 16th.—Present: 19 members.

Pig Keeping.—Mr. J. Ryan, in the course of an address on this subject, first dealt with the origin and development of the present-day pig—the various types and the characteristics of each, including such well known breeds as Berkshire, Large York, Tamworth, and Mid York. In a test in Canada of 2,000 pigs these four breeds had proved most successful. For a farmer going in for pig keeping he would not recommend

MEGGITTS
LINSEED
MEAL
FOR DAIRY COWS

pedigreed stock for a start. Berkshire x Tamworth sow to Large York boar would give good results to the beginner. In regard to farrowing he did not favor placing the sow in the farrowing pen until about a week before due, neither did he favor sloppy feed for the farrowing sow. He recommended tying and dressing the navel strings of the piglets if the sow was quiet. Castrating could be carried out at four weeks, and the suckers weaned at six or preferably eight weeks. They could be dosed for worms at four weeks if necessary—one teaspoonful of turps for each month, given in milk for three days. In the case of a young sow with her first litter it was advisable, if the litter was a large one, to pick out six or eight and kill the balance. The ultimate result of this would be more profitable than if the full litter was left for the sow to rear. A sow should not be mated under eight months, preferably not until 10 or 12 months. In choosing a young sow for breeding purposes select one with not less than 10 teats, and also from a large litter if possible. In feeding pigs, he favored the dry method. He had got good results from scattering the whole grain on the ground. The pigs would pick up every grain and would not bolt it down as they would if fed from a trough. If it was desired to soak the grain it should be soaked for not less than 30 hours. Milk, of course, was one of the best possible feeds for pigs, either sweet or sour, but it should be given always sweet or always sour; never change about or serious trouble would result. Peas, too, were a valuable feed, but should be fed sparingly—about 25 per cent. of the total ration. Meat meal could be used as a substitute for green feed and milk. Of the green feeds, lucerne was easily the best. Artichokes were a hardy plant and he had fed them with advantage when nothing better was available. The quantity of feed for a growing pig was about 5lbs. for every 100lbs. weight. *Diseases*: The biggest pest in connection with pig diseases was worms, particularly the long round worm. These worms harbored in the intestines of pigs, and the embryos or young worms passed through the wall of the intestine and were often the cause of thumps, malnutrition, &c. One of the best anthelmintics for ascarides was oil of chenopodium—the dose being 4 cubic centimetres for a 75lbs. to 100lbs. pig given in 1oz. of castor oil; each pig should be fasted for 24 hours before being given this medicine. Asked if it was detrimental to the pigs' welfare to place rings in the nose, Mr. Ryan replied in the negative, and said the pig would not lose weight. Another method was to split the cartilage, this was very effective, but the advantage of the ring was that if desired at any time to allow the pig to root the ring could be removed. Two or three rings could be put in and if one got torn out it would save catching the pig again. In reply to Mr. Manning, Mr. Ryan said that it was most important to choose a breeding sow from a large litter, his experience had proved that, and it was more important still in the choosing of a boar. In reply to a question *re* castrating, Mr. Ryan said he always placed the pig in the recumbent position. Mr. Manning favored holding the pig up by the legs. Messrs. Dinning and Hunt also favored this position. For a dressing after the operation Mr. Ryan said Flint's oil was one of the best. Mr. Manning used kerosene, Mr. F. Dinning used white pepper, and Mr. Packer oil and eucalyptus. Mr. Warland inquired if rabbits were good pig feed. Mr. Ryan said he had used them to advantage, but they should be well cooked, as they were often affected with hydatids. (Secretary, A. Ross.)

Penola Women's Branch: Homestead meeting held at the residence of the President (Mrs. W. A. Clifford).



Mount Gambier Potato Crop Competition: Mr. H. C. Patzel's entry in Snowflake Class. Yield—12 tons 9cwt. 72lbs. Eight and two-third bags were marketable, and one and a half bags small, or rejects, from half square chain. Dug under the supervision of the judge. (First Prize).

Mount Gambier Potato Crop Competition: Mr. C. R. Patzel's entry. Yield.—10 tons 8cwts. 44lbs.; seven and a half bags were marketable. (Second Prize).

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Wolseley	16/6/32	200	Annual Meeting	E. Sharrad
Wolseley	16/6/32	30	Pruning Demonstration, H. H. Orchard	E. Sharrad
Mt. Gambier ..	8/7/32	12	Annual Meeting	G. Gurry
Penola	8/7/32	9	Annual Meeting	F. Hinze
Mundalla	14/7/32	13	"Wheat Diseases," L. Dinning	A. Ross
Tintinara	23/7/32	9	Annual Meeting	W. Bridle
Allandale East .	15/7/32	13	Discussion	T. Earl
Kongorong	18/7/32	—	Address and Social	F. Caine

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WEPOWIE (Average annual rainfall, 13in. to 14in.).

May 24th.—Present: 15 members.

MONEY AND CREDIT.—Mr. V. Knauerhause read the following paper:—"The study of money and credit is a fairly small, but very important branch of economics, and the monetary system is the basis of our present-day economic structure. By the economic structure of a society or a country is meant the system by which the members of that society are able to exchange the goods they have for the goods which they require; the system by which they are able to sell the products they have either grown or manufactured, and buy with the money obtained the articles they require—groceries, clothing, implements, &c. On the surface, it might seem as though this system is simple enough, but when we begin to inquire into the nature of that system we see what a complex thing it is. As an example, take the management of a farm. The farmer is able to grow his own wheat, produce his own meat, milk and butter, eggs, and vegetables. It might be thought that he could be quite independent of others in the society or country in which he lives. But under the present complex system of the exchange of goods it is impossible for him to remain quite independent. It is true that he is fairly independent compared with the person living in the city, but nevertheless, he looks to others to supply him with many of his necessities. To take a simple example, the farmer sells his wheat. With the money he receives he may go to the stores and buy flour, groceries, and clothing, from the manufacturer he may get manure for the next season. If, after he has made these purchases, there is still some money left, he may buy some other necessities or bank his money. It should be noted, however, that in this discussion of the farmer' activities, we have supposed that there is some sort of economic structure in existence. In the first place there is some system of money and banking; in the second place we have supposed that the articles which were required were ready at hand in the grocer's shop. But the grocer himself had to buy the flour from the miller; he had to import the spices from overseas; he had to get some of the clothing probably from England. Then we should notice again that there must be mills to grind the flour, plantations to grow the spices, factories to produce the clothing. Further, we should notice that before the goods can be brought to the grocer there must be adequate shipping and transport facilities; and above all, there must be some banking system by which payment can be made for the goods or for transport. It will clearly be seen from this discussion that the economic structure at the present time is very complex. How complicated the whole system is may be seen also from the fact that although conditions are so bad generally and many people are either unemployed or nearly bankrupt, nevertheless there is a surplus of many different products, there is a surplus of wheat, coffee, clothing, and machinery, &c. There is no shortage of produce nor manufactured goods; there is only a shortage of money among the general public. It may be seen from the foregoing discussion that if we merely perform the simple act of buying a pound of tea, we take for granted that there are already in existence plantations, factories, transport facilities, and money. It should be noted, however, that purchases were not always effected as they are at present. At one time all trading was done by means of barter. This system is still resorted to by small boys when, for instance, they agree to "swop" 10 marbles for a spinning top or something like that. At one time all exchange was effected in this way. A person having a hundred bags of wheat would try to find someone with a package of clothing; he would then exchange some of his wheat for some clothing. It can easily be seen what a difficult business it would be to decide how much wheat should be given for so much clothing. Perhaps one man would have a surplus of wheat and then he might be willing to take pieces of gold or silver in exchange for his wheat, and when he wanted some tea, for example, he might find that the tea merchant would accept gold in exchange for tea. This is the beginning of the money system by which goods are no longer exchanged for goods, but for some medium of exchange, which is called money, and which in this case is gold and silver. A very important point to notice about money is that it has no value except as a medium of exchange. Of course, it is an advantage to use as money such things as gold or silver, which have a value apart from their value as money, but it should be noticed that pieces of lead or even stones could be used as money provided everyone in the community were willing to accept them as payment for their goods. I make a distinction between money and credit. By money is meant the gold, copper, and silver coins in use, and perhaps banknotes. By credit—cheques, bills of exchange, bank drafts, &c. Our monetary system in Australia, then, consists of gold sovereigns, silver and copper money, and banknotes. The basis of this system is the gold sovereign; the silver, copper, and banknotes receive their value from the gold sovereign. Thus by law it is fixed that no matter what value the silver or copper may be, 20 shillings and 240 pennies may always be received in exchange for one sovereign. The value of a banknote lies, really, only in its promise to pay gold to the holder; hence will be seen on each banknote the promise that gold coin will be paid if the note is handed in at the Sydney branch of the Commonwealth Bank. This, of course, is not true at the present time, but it has no effect upon the value of the note, since anyone in Australia will give 20 shillings in exchange for a pound note. At the present time credit has largely supplanted money as a medium of exchange, and it is for this reason a more important subject. The credit system depends upon the existence of banks, and it will be interesting to inquire how the banks came into existence, say, in England, for example. In England the jewellers began the banking system. These jewellers had strong iron safes to guard their supplies of gold, and so anyone having a few gold or silver coins in his home would take them to the jeweller, for they would be safer in his strong-room than at home. After a time the jeweller would have a considerable amount in his safe. Let us suppose that A owed B £5 and that both had dealings with the jeweller. Then instead of giving A 5 gold coins with which to pay B the jeweller might give A a signed slip of paper promising to pay the holder 5 gold coins when

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it was handed back to him. A could give this slip of paper to B and B would take it to the jeweller. This was the start of the modern cheque system. Again, the jeweller might issue notes promising to pay the holder in gold coin. Further, he might find that he had in his vault a considerable amount of gold, say £50,000. He would lend some of this money (always keeping a reserve) to his clients at a fixed interest. At this stage the jeweller would be a banker doing exactly what the banker does at the present day. There is one point of interest in connection with banking which everyone should know, especially as it has been considerably in the foreground during the last few years. It is a fact well known to all that during the last few years money has been very "scarce"; the banker is not willing at present to advance money or credit, except on good security. It is interesting to see why this is so. In describing the jeweller I mentioned that he would lend money on interest, always taking care that he had an adequate reserve of gold. It has been found by experience that only a certain proportion of the money lent is necessary as a gold reserve. In general it has been found that about four times as much money may be lent as gold is held in reserve. Let it be supposed that a person goes to the banker for a loan of £100; notice that the banker does not possess this money; he creates or manufactures the money, or really, credit. What happens is, in effect, this: The banker says, 'You use our cheque books and if a cheque from our bank signed by you arrives here I will pay the holder in banknotes or silver, provided the cheque does not exceed £100. But the banker cannot continue to lend out money on credit in this way because if he did so he would soon have far too much money on loan in proportion to the amount of his reserve. Hence, after the banker has lent out a certain amount of money he begins to restrict his credit; he is no longer willing to lend money to clients except on very good security. The banker may even wish to reduce the proportion of credit to that of his reserve; in this case he might demand the payment of loans and perhaps refuse credit altogether. This process is, in effect, exactly what the bankers have been doing during the last few years. Another point should be noted in connection with the manufacturing of credit. Let us suppose that A owes B £50 and that they both deal at the same bank. A may go to the banker and get a loan of £50. Under ordinary circumstances the banker will manufacture or create this credit. A may now pay B with this money and B will, let us suppose, pay this amount into the bank as a deposit. Notice what has happened: The bank has created £50 credit, and since B has paid it into the same bank as a deposit the bank has become liable for £50 and this money is, in fact, not real at all. *Foreign Exchange*: It might not be generally known that all imports must be paid by exports; hence, if machinery and clothing are imported from England to Australia the only way in which Australia as a country may pay for these goods is by exporting to England some of her products, such as wheat, wool, frozen meat, fruit, or gold bullion. One very important factor influencing the rate of exchange between two countries is the balance of indebtedness between those countries. Thus, if Australia has imported more goods from England than she has exported to England the balance of indebtedness will be in favor of England, and the rate of exchange will be unfavorable for Australia. Since all debts to foreign countries must be paid through the bank, the bank is able to control the rate of exchange. This is what is happening in Australia at the present time; the rate of exchange is fixed by the bank. Let us suppose that the rate of exchange is such that £115 must be paid to the bank here to pay a debt of £100 in England. That means that for every £100 worth of goods imported we must pay £115, and that for every £100 worth of goods exported we receive £115. It follows from this that in such a case it is advantageous for Australia if she exports and not advantageous if she imports. Suppose that the rate of exchange goes up from £115 to £120 for £100. The value of our exports will be increased in proportion, and in particular the price of wheat will rise. The economic system of the present time is very complex, and is in the main possible only through the credit and banking system. Money need not necessarily have, but usually does have, a value apart from its junction as a medium of exchange. Imports from a country are in general paid for by exports to that country. And finally, if the rate of exchange becomes more unfavorable for a country the value of its exports is increased.'' (Secretary, S. C. Rooke.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Eurelia	29/6/32	15	Address—C. Goddard ...	E. Wall
Wilmington ...	21/7/32	18	Addresses—E. L. Orchard and H. C. Pritchard	C. Cole

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

YANDIAH.

June 10th.—Present: 14 members.

Care of the Breeding Ewe.—The following paper was read by Mr. A. R. Keller:—"Owing to the dry seasons that have been experienced, flocks have been greatly reduced, breeding ewes are in great demand, and on that account one does not advocate heavy culling when selecting the ewes for breeding. Old ewes are the best mothers, provided they are still sound in constitution. At shearing any ragged or poor fleeces should be rejected and a mark put on the sheep, and after shearing a thorough inspection would be necessary to cull out any that are getting faulty in the mouth. About the middle of October the rams should be joined; about 2 per cent. should be sufficient, but 3 per cent. is preferable in order to have the lambing period as short as possible. Then the lambs would be more uniform in size, which is an advantage at tailing, because most of them could be done on the same day when four or five weeks old. There would then be no need to keep the sheep confined to the same paddock for very long, and they would benefit by a change. March is the best time for lambing; the two extremes of the seasons, the heat and the cold, both are disastrous to young lambs, and the weather at this time should be between the two. At this time there should still be good dry feed about, grass or stubble, as a month later might see the dry feed spoilt by a rain, and no green feed available. As it is mostly Merinos that are handled, the March lamb might not grow as quickly as a June lamb, yet at shearing the difference in the quantity and quality of the wool from the two lambs would be quite considerable. The early lamb if well grown would breed the next season. Before lambing, ewes should be crutched and separated from the other sheep if possible, and put into a good paddock that has been saved for them. It is very important that the flock is quiet, because at this stage they need a lot of attention, and if you can afford the time, take a walk round them every day, because there may be some that need assistance. If the young lamb seems weak or does not feel inclined to get up, as long as the mother stays with him do not interfere. Keep the dog at home when making the rounds, even if the sheep are used to it. An old ewe becomes irritated if the dog tries to get close to her, and she gets bold enough to attack any dog; as the lamb gets older she becomes less furious, but this bad habit is very annoying, and might spoil a good dog. The young ewe, on the other hand, becomes timid at the sight of the dog, and might desert the lamb, and if she does return to him later, she may find that her offspring has already fallen a prey to hawks or crows. If the season is dry, start hand-feeding before the paddock gets bare. A home-made self-feeder is best for economical feeding. A simple method of feeding is with sheep nuts, as you only need to put them on the ground; but that class of feed is too expensive when fed by itself, and if not enough is given, the sheep are not satisfied, and will wander about too much. The best feed for the ewe is either bran or oats mixed with hay chaff." (Secretary, F. L. Jettner.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Narridy	4/6/32	17	Address—" Dairying," Roberts	H. Cox
Narridy	28/6/32	13	Address—C. Goddard ...	H. Cox
Appila	30/6/32	12	Address—C. Goddard ...	E. Wurst
Yandiah.......	1/7/32	15	Address—L. W. Judell...	F. Jettner

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

GREENOCK.

May 23rd.—Present: 38 members.

The Hon. Secretary gave an address and demonstration of Vine Pruning. Mr. W. Roenfeldt reported on his fertiliser experiments with cereals and vines.

Seasonal Report on Vines.—The following report was read by Mr. A. Schubert at the April meeting:—"Rainfall in this district is of the utmost importance for the vine grower, because he depends entirely upon rain for moisture. Rainfall for 1931 was nearly 20in., 2½in. above 1930, but still 1½in. below average. Winter was considerably wetter than the average season, and by the end of April the fall was 1in. below the average, and by the end of September more than 1¼in. above average. Only 1½in. were received the last three months, whereas usually more than 4in. are received. Winter being so wet, pruning was left a little later than normal. July and August are generally considered the best months for pruning vines. The strength of the vines and soils should always be considered when pruning; the pruner should err rather in giving too little wood than too much. It will be necessary to use some preventive for black spot on those vines subject to this disease last year. Fertilising the vineyards should receive much more attention and thought from every grower. Ploughing is important and speed should not be sacrificed to thoroughness and depth. September is usually considered the best month for ploughing. The first week in September was too wet to think of ploughing, yet after a week in which strong, drying winds were experienced, the ground in most cases was too hard to plough. During the last week of September ½in. to 1in. of rain fell. The ploughs were again set going, and nearly all growers finished ploughing. If there had not been the fear of frosts it would have been wise to harrow and cultivate at this time. However, fears of a further frost were justified, and on the first Sunday in October another frost was recorded. This was more severe than the first, and although this district did not suffer as much as Light's Pass and Barossa, nearly every grower lost an acre. October proved very hot and dry, only a few points of rain, and in most cases it was impossible to harrow or cultivate, the moisture evaporating very quickly through the rough ground. Vines made a very vigorous growth and were showing a good crop, except the frosted areas; these set very few bunches. November was rather cold and misty, but no rain fell. The weather was rather adverse to flowering, although generally the berries set fairly well. At this time thrips were doing damage in other parts of the State, but in spite of them being noticed here damage was practically nil. Rutherglen fly was in evidence in some gardens, which were rather dirty. The first week in December brought a welcome rain, but unfortunately was very patchy, Greenock recording only 10 points, the most neglected gardens at last being worked either with the cultivator or harrows. December proved very hot, and the whole of January still hotter, the thermometer hardly leaving the century mark. Vines were very distressed. The berries were very small and apparently lifeless. In February a general rain of about 1½in. fell throughout the district. Grapes doubled in size within a week, started to ripen nicely, and the weather kept cool, cloudy, with mist right through the month. Finally the vintage proved to be much better and heavier than anyone had dared to hope, and, with but one or two exceptions, every grower had considerably more than the last few years. However, there is for some growers another trouble, and in some instances a serious loss. Owing to a very wet April mould developed in Grenache and Doradillos. Unfortunately hundreds of tons were lost by unfortunate growers.'' (Secretary, H. Wilksch.)

PENWORTHAM.

May 26th.—Present: 15 members.

SIDELINES.—Mr. J Allcock read the following paper:—''Sheep at the present time offer the greatest possibilities. They are almost essential as a means of keeping fallows clean and providing the home with meat. There is a big margin between killing your own mutton and buying from the butcher. In this district fat lambs are more profitable than wool, if worked on the right lines. The average Merino fleece weighs about 9lbs. to 11lbs. This, with wool at an average price of 8d. per lb., would net 6s. to 7s. 6d. per fleece, and a fat Merino lamb would be valued at about 12s. If one went in for fat lambs, wool would be a secondary consideration. I favor the Merino ewe crossed with the Dorset Horn ram and the progeny crossed back to the Southdown ram. This ewe (Dorset-Merino) is the best mother procurable; she is a fine, big, robust ewe, and would rear two lambs a year and do it well. This type of ewe would cut between 7lbs. and 9lbs. of wool; valued at about 6d. per lb., would return about 5s. for wool. When it is realised that this ewe will rear two lambs valued at 17s. 6d. each, and wool 5s., a total of £2, against the Merino total of 19s. 6d., it will be agreed that the crossbred is a better proposition. Another factor that is not taken into consideration generally is the blowfly pest, the crossbred not being so subject to the fly as the Merino, because the former does not carry so much wool and wrinkle around the breech. I favor crutching three weeks before lambing starts, then spraying with a good arsenical preparation. Good results have been obtained with Cooper's dip mixed at double strength 1 in 65. Lambs should be tailed at the age of three weeks. Poultry is a sideline that could be vastly improved on the majority of farms. If farmers could be induced to obtain a good type of bird and look after them, egg returns would go up by leaps and bounds. I favor the Black Orpington as the best utility fowl, and second only to the White Leghorn as a layer. Farmers should obtain 50 chicks from a reputable breeder as the foundation of the flock. Eggs from these birds should average at least 9d. per dozen, and show a return of 15s. per year per hen. Most farms could run at least 100 laying hens, and managed properly will show the pleasing returns of £75 per year. This is obtained with the least labor attached to any sidelines. *Pigs.*—The pig market makes such sharp fluctuations that it is difficult to forecast the future of this sideline, but all should carry on in the hope of better times. Of the four breeds most favored—Berkshire, Tamworth, Large White, and Middle Yorkshires—the Berkshire should be set aside because of their small litters, but crossed with the Tamworth sow it produces an ideal pig, with the possibility of a larger litter. Large York produces large litters, but one does not get that compact sucker that commands attention in the sale ring. A farmer should be able to keep four breeding sows, and if of the right type that will rear 10 pigs at a litter, they should at least pay for feed. The sows rear 10 pigs at each litter and have two litters a year, and these realise 10s. per head at six weeks old, the return will be £40 from four sows each year. *Dairying.*—Under present prices I believe the dairying side of farming is the hardest work on the farm for the amount of cash obtained. The returns come in once a fortnight, bringing in a little ready cash but if men folk on the farm had the work to do that cows entail, very few cows would be kept on the farm. I favor a cow that will put cream in the can, and when she is no longer wanted for this purpose, return a good cheque when sent to the butcher. For this purpose the Friesian fills the bill better than any other breed. The cows should make at least 300lbs. of butter per year, which would return about £19, and averaging the calves at £2 (excepting the Jersey) would bring it to £29 per cow. If the farmer could carry 10 cows, they would net him roughly £200 per year.'' (Secretary, A. Jenner.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Brinkworth ...	18/7/32	15	Annual Meeting	H. Ottens
Upper Wakefield	16/6/32	11	Question Box	C. Neumann, Halbury
Rosedale	14/6/32	17	Address—W. J. Dawkins.	H. Muegge
Red Hill	5/7/32	14	Address—W. C. Johnston	S. Pengilly
Truro	11/7/32	20 and 40 visitors	Address—C. F. Anderson	L. Davis
Snowtown	8/7/32	11	Address—W. C. Johnston	A. Hocking
Hoyleton	4/7/32	19	Address—W. C. Johnston	W. Chapman
Buchanan	15/6/32	8	Address—W. C. Johnston	L. Bell, Marrabel
Blyth	1/7/32	14	"Breeding Draught Horses," A. L. McEwin	L. Mugge
Black Springs .	12/7/32	5	Annual Meeting	K. Dunn
Rosedale	15/7/32	15	Address—J. L. Williams .	H. Muegge
Stockport	15/7/32	16	Annual Meeting	L. Klaffer

YORKE PENINSULA DISTRICT.

(TO BUTE.)

BOORS PLAINS.

May 5th.—Present: 12 members.

COLT BREAKING.—Mr. C. Rodda read the following paper:—''Colt breaking on the farm is an important job and should be treated as such, because the whole of the horse's future behavior depends greatly on the handling it receives during the first few weeks. A man must have several years' experience with horses before he can successfully handle colts; one colt may have quite a different temperament to another, and therefore need different treatment. *Handling Draught Horses.*—The first thing one should aim at is to gain the confidence of the horse, and the younger the horse the easier this is to accomplish. For catching a colt, a small round yard is better than a square-cornered one; in the latter a horse may turn around quickly and have a man cornered. Have the colt in the yard by itself and with a light stick, about 6ft. in length, rub him over the back and get him to nearly face you, standing a little to the near side. Keep your eye fixed on the colt's eye and talk to it in a quiet but commanding voice, and with your right hand move the stick over his back and wither, and try gradually to get close enough to rub his neck with your left, all the while watching his eye. Some colts may need the whip to stop them from continually turning their heels towards you. After you can get your hand on him, try to put on a halter by holding the head strap and putting it over his neck at the wither and working it forward. Hold it with both hands and quietly put it over his nose. With some colts it is necessary to first put the rope around the neck, tying it with a bowline knot, and fixing it to a post to fix on the halter. In tying up a young horse for the first time or two, always put on a body rope and use the neck rope merely to steady the head. Pass both ropes through the back ring of the halter and keep the body rope a little tighter than the neck rope. This is very important, because the colt generally gives up pulling quicker and does not injure or make its neck sore. There is no need to have separate ropes if you have one good long one. Leave the colt tied up for several hours and put a bit in its mouth to allow it to become accustomed to it. Have a look at short intervals to see that he is not hooked up in any way, and talk to the colt for a few minutes while rubbing your hand around its head. The next job is teaching him to lead. Use a strong, light rope, and if you use it double, always fasten the middle of the rope on to the bit, then you have no join in the end of the rope, which would be very dangerous if the colt gets out of control and you happen to get the rope around a leg or arm. Pull the colt around in the loose box or yard, and teach him to come around to both near and offsides. When taking him into a bigger yard, have extra assistance on the rope, because he will try to regain his freedom the first time he is taken out, and if he does so, the longer it will take to teach him he is not the master. If you are short-handed, it may be an advantage to also use a body rope, thereby keeping his head down and making him easier to control. No set rules can be laid down for teaching to lead; there are several different methods which suit different horses. Many will come to lead quickly by one man following with a whip and making them circle for a while, then taking them on the straight. Keep well back unless the colt stops or hangs back, when a smack with the whip will generally help. Another method which works on many colts is the breeching rope. Procure a good, light rope about 25ft. long, double it, and pass an ordinary bit ring over the double end. Put the loop over the horse's rump, letting it hang down to the breech, and with the ring on the horse's back, pass the single ends through each bit ring. Then standing 2yds. or 3yds. in front, keep a tension on the ropes, pulling harder on one, then the other, and the colt will generally soon follow. If a colt sulks and will not lead with the breeching rope, give him a good whipping, and immediately tie him up to a handy post and leave him alone for a while. Then taking him quietly, try leading him again, and this method will seldom fail. To teach the colt to lead while walking alongside, as is done with show horses, needs much more time and patience, but is unnecessary for general farm horses. The next thing is to put the colt into harness. I recommend first putting him in a spring trolley with a quiet horse, unless the wagon is being used, where the colt can be put in the body of the team. When harnessing, always have good, strong harness, and leave the halter on. Take out the bit and put on the winkers over the halter, and there will be no danger of breaking or pulling off the winkers. Use a bit strap in place of a snap on the bit ring. See that the collar is a snug fit; have it a bit tight rather than at all loose. If you have not much assistance, tie up the colt to a convenient post to hook him in for a start. Always use a neck rope until the colt is broken in. If you have no assistance to hook him in the team, put him between two quiet horses and drive them around until the colt finds he cannot get away. For team work first put the colt on the near side of the body of a tandem team, putting him in further after a few times. The near side leader should be staunch in case the colt tries to hang back. Care should be taken not to try and turn the team short until the colt learns how to do it. Only work the colt a few hours for the first day and not more than half days for some time, working according to the age of the horse and strength. Always feed colts well and treat them quietly and kindly, and have plenty of patience, but be firm to let them know who is the master. I believe in handling colts right from foals, teaching them to lead and tie up; then by handling them a little once or twice a year they are ready to harness up whenever they are wanted. The best time to break them in to work is before seeding or during spring, because there is generally more time to devote to them during those periods. Start them working at about 2½ to 3 years of age, but be careful not to overwork them until they are properly hardened. If you do not overload the team, well grown colts at 2½ years soon harden and can stand constant work. The harvester is a good place to quieten them. Colts learn as much in three or four weeks in the harvester as they do in nearly all the rest of the year's work, but they need to have had a few "hooks in" a team before, so that no time is lost with them when you are busy. Look upon the horse as a friend and treat him accordingly." (Secretary, S. Chynoweth.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
South Kilkerran	12/7/32	10	Annual Meeting	R. Hasting
Paskeville	12/7/32	15	Annual Meeting	J. Prouse

WESTERN DISTRICT.

GREEN PATCH (Average annual rainfall, 26.56in.).
May 19th.—Present: nine members.

Silage.—Mr. H. D. Adams (District Agricultural Instructor) tabled a specimen of silage made by Mr Jericho, of Yallunda Flat. He then answered several questions on the making of silage. In a discussion on poultry, Mr. Rieskie stated that fowls must be warmly housed. If not they used up much of their food in keeping up their temperature. He stated that fowlhouses must be kept clean and should be sprayed at least once a fortnight to keep down lice, red mite, and tick. He used a mixture of kerosene and used crank case oil, and found same effective. *Vegetable Red Mite.*—An insect that was making vegetable gardening almost impossible in the district was, Mr. Rieskie stated, being checked in Port Lincoln by spraying with a mixture of kerosene 1 cup, 1oz. washing blue, to 8galls. of water. *The Chronicle Competition for Sidelines on Eyre Peninsula Farms.*—Mr. Adams explained the competition. Members thought it was an excellent move, and it was resolved to pass a vote of appreciation to the proprietors of the *Chronicle* for such practical help and encouragement to the Peninsula farmers, and the opinion was expressed that the competition would be of great value to Eyre Peninsula. (Secretary, T. Whillas.)

POOR CROPS A SOIL ROBBER.

It does not seem possible that poor Crops should be harder on a Soil than good crops, but, according to Scientists, it is so

WHY POOR CROPS CONTRIBUTE TO POOR SOILS.

1. Poor crops develop greater soil erosion.
2. Permit leaching of plant nutrients from Soil.
3. Lower organic content of Soil.
4. Lessen bacterial action.

WHEN GOOD CROPS ARE GROWN.

1. There is a great volume of roots and other residue left to be incorporated in Soil.
2. When crops are well Fertilized, and high yields produced, in balanced rotation, organic content of Soil is maintained even though the normal amount of crop is removed.

A POOR CROP LEAVES ONLY A FEW HUNDRED POUNDS OF ORGANIC RESIDUE.
A GOOD CROP LEAVES TWO TONS OR MORE TO ENRICH THE SOIL FOR NEXT CROP.

GROW THE "GOOD" CROP WITH TOP BRAND
SUPER AND LEAVE YOUR SOIL ENRICHED.

Manufactured by

The Adelaide Chemical and Fertilizer Co. Ltd.

Works, PORT ADELAIDE. Offices, CURRIE STREET, ADELAIDE.

KYANCUTTA.

May 3rd.—Present: 15 members.

SEEDING OPERATIONS.—Mr. J. Dyke read the following paper:—"In preparing for seeding it is as well to overhaul the drill or combine, unless this was done at end of last season's work. In getting either machine ready for use, first see that all bolts and nuts are tight and replace all badly worn parts; too much play in bearings is likely to cause breakages, and these cause delay in getting on with the work. Also, clean the stars in the manure feed if necessary and paint over with kerosene, and they will be less liable to clog if slightly damp super is used. It is also a good plan to paint the inside of the grain feeders with kerosene, which will counteract the effects of dry pickled wheat, or as an alternative, paint them inside with thin blacklead, and during seeding every now and then paint the grain feeds on the outside with oil thinned down with kerosene or used crank case oil, because all pickled wheat is apt to corrode the wheels in the grain feed cups. Regarding depth of sowing I consider 1in. deep enough. With regard to methods of cultivation, if it is intended to crop fresh burnt ground, the most payable method is to plough lightly or cultivate, drill, and harrow, or if the combine is used this work can be done before rain, because there would be no danger of weeds. This ground the following season should be loose enough to be drilled in and harrowed, and should grow a payable crop. The essential point is to have a loose mulch of fine soil on top and a firm seedbed below; with a deep, loose tilth the moisture dries out more rapidly. If sowing oats on stubble land, drill in early and most seasons the crop will grow ahead of weeds. Stubble ground to be sown with wheat is better left until the first rains have germinated; then this ground can be cultivated, drilled, and harrowed, or combined in and harrowed, and sown with heavier dressings of super and seed. Fallow ground, if well worked and kept clear of weeds, will do just as well sown dry as wet, because clean fallow usually shows no weeds after the first rain. After cultivation weeds will appear, so that if weeds have been kept under control while the ground has been lying fallow, there should be no reason why, if it is sown dry with, say, 60lbs. seed and 60lbs. or 70lbs. super, it should not grow as good a crop as if sown wet. If it be sown dry and makes an even start, then it has every chance of choking the weeds instead of the weeds gaining the upper hand."

Mr. D. Fitzgerald also read a paper:—"There are many points to be considered when dealing with the subject, 'Seeding,' and one of first importance is locality, because practices recommended for one particular district will not apply to others. So far as this district is concerned generally, the main factor is early sowing of the right variety of wheat, but the land to be cropped must be in the right condition to receive the seed, and there is certainly no better condition than well-worked fallow. Great care should be taken that the right class of land is fallowed; by this is meant patches of land that have a tendency to drift badly should be left in their natural state and ploughed up as raw land the following seeding. Land of a limestone rubble type can be fallowed almost any season without much danger of excessive drift, as would be the case with flats between rises. Rising land should be left well alone, especially if of a red, loamy nature. Good results can be obtained also from early sowing on clean land which is free from mustard and barley grass. The latter, I believe, is the biggest check to cereal crops. Land to be cropped showing signs of barley grass should be burnt and worked over with a light implement while still in a dry condition in order to cover the seed of the barley grass and other weeds, so that a good germination of these will result after the first rain. Approximately 10 days after rain this land should be worked over again with a shear plough, then harrowed and drilled with a disc or hoe drill, preferably in warm, drying weather, to kill any remaining grass which may not have been turned under. I do not favor the use of the combine because it plants the seed too deeply and does not give the best results as a weed killer. The ordinary drill will place the seed on a much more even bed than the combine. Variety of seed is a matter of personal opinion. I have tried many varieties, and during the past three years Nabawa (sown in April) has been outstanding. I do not advocate the sowing of this variety on land where weeds are likely to be prevalent because it is rather slow at getting away for the start. Of early varieties, the choice lies between Golden Drop and Canberra; not too large an acreage of the former should be sown, because it has a tendency to lodge badly. All necessary preparations should be made prior to seeding, implements looked over to see everything is in order, and any weak or worn parts replaced or procured to save delay should a breakage occur; such delays often mean the loss of bags of wheat at harvest time. Seed wheat should be graded and dry pickled prior to seeding so that no delay will result when conditions for cropping are ideal. I strongly advocate the use of dry pickle because none of the grain is injured, therefore a better germination will result, and there is not so much damage of wheat malting. It also enables the farmer to do the job at any time before seeding, because dry pickled wheat will not be affected whilst standing over a period of time. For the farmer who has no grader with a pickling attachment, the ordinary winnower with an open screen makes a very fair sample, and an effective duster for the dry pickling can be obtained at a reasonable figure and is quite suitable for the average farmer. Nothing should command more attention during the seeding months than the care of the working horses, for to put in the crop to time the horses must be kept in the pink of condition; they should be fed regularly and given time to eat their breakfast and dinner before going to the paddock; allow approximately 1¼ hours for each of these feeds. The night feed should consist of enough to last through the night in order that there will be a little chaff left in the manger the following morning. The horses' shoulders should be especially cared for and washed with cold water at the dinner hour, a process which takes only a few minutes for the largest team. Collars should be pounded each morning, and at least the shoulders of the horses should be groomed. Care should be taken to see the collars fit the horses' necks correctly, and I strongly urge the use of collar bags, providing they are used properly. The horses' feet should also be kept trimmed, and a good supply of water always available for the horses when they feel inclined to drink. Farmers should make a special study of their own particular farm and work same accordingly, because the same principle of working does not apply to all classes of soils.'' (Secretary, J. Dyke.)

TARAGORO.

May 5th.—Present: 11 members and five visitors.

Mr. J. Crooks read a paper on ''The Farm Flock.'':—''For the production of wool in this district I prefer the Merino, of good size, compact build, broad, with depth of side, well ribbed, clean faced from the eyes, with a dense fleece showing plenty of character and also a fair amount of yolk. The heavy, greasy fleece may not be so valuable per pound, but it makes up for loss in value by extra weight. The farm flock is usually handled in a more or less haphazard manner, and regarded as a side

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line to bring in a few extra pounds during the year. In my opinion it should be treated as a branch of the general operations of the farm. More time could be spent in tending the flock, and the sheep should be frequently and carefully handled. Six weeks or two months before lambing all ewes should be crutched, so that at lambing time trouble from flies would be reduced to a minimum. When the sheep start to scour, they should be kept as clean as possible. A useful preventive is a good fluid sheep dip. It is also an effective cure for sheep that have been struck. Tar, kerosine, or oil have a detrimental effect on the wool, which results in consequently reduced prices. Lambs should drop from the middle of May to the middle of June. By this time green feed will have become established and provide nutriment for the ewe to produce a plentiful supply of milk. Do not overstock, sheep poorly nourished produce miserable lambs and a fleece of poor and light quality. A convenient-sized flock—according to what the holding can comfortably manage—will amply repay the farmer for the labor entailed. Rams should be changed about every two years, to maintain the standard of the flock. Before each shearing, the flock should be subjected to rigid culling, and any faulty sheep classed out. In this way a farmer should be able to keep his flock up to a fairly high standard.'' In the discussion that followed, Mr. E. James suggested drilling oats in for feed, and advised farmers to avoid overstocking. Mr. O. Guy said changing the flock from one paddock to another was advisable, and a small paddock near the homestead would assist at lambing time, so that the farmer could give full attention to the flock. Mr. M. Guy favored the Dorset-Horn crossed with a Merino ewe to produce lambs suitable for export. Mr. A. Edwards favored lambs dropped about the middle of April. Mr. J. Crooks, in reply, stated that rams should be young and not have more than 50 ewes to each ram. For export lambs, he favored the Southdown or Shropshire ram crossed with Merino ewes. Mr. H. Adams (District Instructor), who during the afternoon had visited several farms in the district, addressed the meeting on the subject, ''Soils and their Fertility,'' and gave suggestions on side lines suitable to the district. He also submitted a sample of ensilage, and mentioned many of its advantages on the farm for dairy cows. (Secretary, T. Winters, Cleve.)

June 16th.—Present: 10 members.

Our Local Bureau.—The Hon. Secretary, Mr. T. Winters, read the following paper:—''Having submitted our report for the past year's work as a Bureau, there are a few improvements that could be effected to retain, at least, if not to stimulate, interest of all members, and plainly it means this, that our Branch can only prove helpful to us as farmers if our interest in it is keen. Our Branch is only a small unit of a State-wide organisation, nevertheless we must keep our end up. An efficient secretary is necessary to any Branch. He it is who is responsible for records of meetings, &c., correspondence, arranging visits of Agricultural Instructors, and much else, and all done in an honorary capacity. I suggest, therefore, that by regular attendance, punctuality, and a live interest in the affairs of your Branch you can lessen his work and make it a pleasure. The choice of subjects to go on the syllabus from time to time can be considerably improved also. To-night is our Annual General Meeting; have the members come prepared with suggestions for the syllabus, and prepared to submit a paper? The choice of subject is better left to the writer responsible for the paper, as he will select a subject on which he is conversant. If members come prepared with suggestions, etc., for the drawing up of a syllabus the job is done more quickly and more satisfactorily. When you are responsible for a paper endeavor to submit it at its given time. Nothing destroys interest in the Branch more than failure to submit a paper when responsible for it. The other members come along to the meeting to enjoy and discuss the subject arranged, and members lose interest if no paper is tabled, especially when they have to return, say, from three to six miles. Farming provides us with many and varied subjects to suit all members, and preparing a syllabus should be an easy task. Let every member accept his share of the responsibility and offer at least one suggestion and undertake to write a paper. Our Branch has 18 members; we hold annually nine meetings; that fact if carried out would give us nine members to write on their selected subjects, and we have amongst our members farmers capable of doing so. Another fact which is rather easily forgotten by members, and one which the secretary loathes, is the payment of subscriptions and fines. Prompt attention to this fact should need no stressing from the Secretary and Treasurer. These are only a few suggestions given to assist our local Branch, and as Secretary, I trust that the coming year's session will enable us to derive in full the benefits of our local Bureau.'' (Secretary, T. Winters, Cleve.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Miltalie	18/6/32	10	Paper from *Journal*	G. Smith
Miltalie	13/7/32	13	Addresses—H. B. Barlow and H. D. Adams	G. Smith
Cungena	7/7/32	20	Annual Meeting	A. Voumard
Palabie	23/6/32	10	Address—W. H. Brownrigg	E. Rashleigh
Maltee	14/7/32	8	Annual Meeting	E. Schwarz
Green Patch	19/7/32	7	Annual Meeting	C. Whillas, Pt. Lincoln
Kelly	14/7/32	19	Address—H. B. Barlow	I. Grund, Kimba
Laura Bay	12/7/32	114	Annual Meeting	W. Edson
Waddikee Rocks	13/7/32	11	Annual Meeting	V. Matthews
Pinbong	25/6/32	9	Discussion	C. Scholz
Pinbong	16/7/32	12	Annual Meeting	C. Scholz
Wudinna	16/7/32	12	" Problems of the Farm," C. Newbon	D. Duguid

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

KALYAN.

February 22nd.—Present: Nine members.

Mr. R. L. Griffiths (District Agricultural Instructor) delivered an address, "Lessons Learned from the Past Season."

BLOWFLY STRIKE IN SHEEP AND THE "MULES" OPERATION FOR REDUCING THE INCIDENCE.—At a further meeting held on March 23rd, Mr. J. Wallis read the following paper:—"Mr. J. H. W. Mules, of Woodside, who owns a small but valuable flock of 'Peppin' Merino sheep, carried out some observations which led him to believe that the irritation of the skin by urine in the breech of the Merino ewe, was the chief predisposing factor to blowfly strike. He found that the most susceptible sheep have a fold of skin about ¾in. high, which extends from the sides of the root of the tail downwards and forwards on the belly, where it peters out. The folds encircle the vulva about 1in. from the middle line, and carry wool sufficiently close up to the inside edge to project inwards and touch the fold of the other side; the result was that the animal could not urinate without soiling the wool, which was practically wet continuously and matted together and rotted by bacterial action. As a result the skin beneath became eczematous, and at the root of the wool there was a collection of serous weeping from the skin and a collection of pus-like material with a putrid odor which was no doubt attractive to blowflies and would be an excellent breeding ground for young maggots. Mr. Mules' procedure is to anticipate the slower breeding methods by removing the folds by a surgical operation. He does it by pinching the fold in the jaws of a 'Burdizzo' castrating pincers, and while holding it there cutting away the projecting skin with a sharp knife. There is no bleeding; the sheep, even if full grown, makes very little fuss, the edges of the wound pressed together by the clamp remain adherent and in a few days the clamped edges slough away. As a result of the operation the ewe lambs grow up with a clean breech approaching in appearance that of the Leicesters. Mr. Mules' observations on grown ewes treated is that where they were previously susceptible to attack (sometimes many times in a season), after the operation they became to all intents and purposes immune. At the request of Dr. Lionel Bull, Chief Government Bacteriologist at the Adelaide Hospital, who visited Mr. Mules's homestead in company with Sir Charles Martin, Chief of the Department of Animal Nutrition of the C.S.I.R., Mr. Mules took observations to see how long it takes a sheep's skin to become susceptible to urine irritation. From when urine stains were first noticed to the strike was 21 days. By removing the skin on one side only Mr. Mules found that the sheep would be susceptible on the untreated side and immune on the treated side. Of course it is quite likely that in a sheep so struck the maggot infection would quickly spread to the treated side, this is only to be expected. It appears as if the practical man amongst sheep, following on the lines indicated, will be able to carry forward the blowfly investigation in a sweeping stride. If the operation reduces the incidence of the breech strike in ewes down to the percentage of the body and head strike the blowfly trouble in Australia would cease to be a major factor. The treatment of lambs during the tailing operation would certainly appear to be worth while. The development of an instrument which would pinch and sever the skin in the one operation would appear to be indicated, but in the meantime the 'Burdizzo' pincers (or masculators), already in the hands of a number of stockmen, will answer very well. What is now needed are some large scale experiments on established flocks. Mr. Mules' treatments date back from 1929.'' (Secretary, R. Lang.)

PARUNA.

June 10th.—Present: 13 members.

The evening was devoted to a Question Box. Each member had to ask a question and also answer one. Mr. C. Webb asked which was the best method of destroying rabbits? Mr. Hondow replied, and suggested a shortening of the time limit for each landholder to destroy the pest. In this district three months were allowed in which to do the work. Mr. Hondow said that if the time was cut down to, say, a fortnight, farmers would soon have rabbits under control. He explained the reason for adopting his plan, and said that if one man got to work early and made a thorough job of his farm and cleaned out all the rabbits, and a neighbor failed to get his done until late in the season, the rabbits on the latter farm would migrate on to his neighbor's farm and he would be just as bad off as ever. (Secretary, F. Sumner.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Copeville	8/5/32	—	Paper—" Diseases of Wheat," A. Hein	G. Sutherland
Alawoona	15/6/32	6	Address—" Oil and Lubrication," H. Stannard	B. Finey
Pinnaroo	27/5/32	14	Veterinary Lecture—D. Cox	H. Badman
Pinnaroo	24/6/32	11	Address—" Woolclassing," T. Rice	H. Badman
Caliph	16/6/32	7	Paper from *Journal*	W. Todd
Yurgo	20/6/32	14	Paper—" Sore Shoulders," J. Bullen	M. Walker
Netherton	27/6/32	9	Address—P. H. Suter ...	C. Wilkin
Parilla	5/7/32	9	Annual Meeting	C. Foale
Kanni	13/7/32	12	Annual Meeting	F. Hoad
Kulkawirra ...	12/7/32	14	Annual Meeting	H. Elliot
Overland Corner	13/7/32	All members	Address—R. L. Griffiths, F. C. Richards	H. Loffler
Paruna	1/7/32	22	Address—M. Shannon ...	F. Sumner
Meribah	11/7/32	11	Question box	E. Carr
Bowhill	18/7/32	8	Annual Meeting	A. Spry
Kalyan	20/7/32	12	Discussion	R. Lang, Goondooloo
Ramco	19/7/32	8	Annual Meeting	J. Odgers
Taplan	20/7/32	8	" Observations on Bureau Meetings," A. McKenzie	P. Hodge, Nangari

SOUTH AND HILLS DISTRICT

CURRENCY CREEK.

May 23rd.—Present: 14 members.

Care of the Farm Team.—Mr. E. Fuller read the following paper:—''Every farmer should devote an hour or two every day to his team. Good, warm stables are necessary and they should be enclosed on three sides and open to the east, to avoid cold, westerly winds in winter. The stables should be cleaned out every day and dry straw put in for bedding. Horses should be groomed down every morning to remove dry sweat and dirt. Care should be taken to ensure working the horses in well-fitting collars. It is advisable not to pull the collars too tight; this has a tendency to draw the skin and cause irritation, and after a while a sore shoulder. Sore shoulders should be washed every night and ointment applied. Lard is a good dressing for sores; it keeps them soft and does not allow them to crack. If working horses over stumpy land, use back bands. The back band will reduce the friction considerably by taking jerks the shoulders would otherwise receive. During seeding it is important to get an early start in the mornings and not work too late at night. Horses should be taken out of the plough by sundown. One round after sundown takes more out of them than four or five in the mornings. It is not a good plan to have particular places in the team for certain horses; change them and give each horse the opportunity of proving itself on the rein. If the work is hard, add a few double handsful of oats to the chaff for the midday feed. Feed, water, and look after the team and they will well repay any trouble and care exercised on their behalf.'' In the discussion which followed, the Secretary asked what the writer put in water when washing horses' shoulders. Mr. Fuller used eucalyptus skin soap and found it excellent. Mr. Kemp used salt and water. Mr. Holme thought that when the team was working well each horse should be put in the same places. Mr. Skewes advised putting a chaff bag under the collar when a horse had sore shoulders. Mr. Burgan asked, ''How many times should a horse be watered whilst in work?'' *Answer*—Twice a day. Mr. Kemp wanted to know which was the best horse for farm work—heavy or light. The writer favored a medium draught. Mr. Holme asked, ''If feeding on oaten chaff should oats then be added to the chaff?'' *Answer*—Yes; at dinner time. (Secretary, D. Gordon.)

HARTLEY (Average annual rainfall, 15in. to 16in.).

April 20th.

Members visited the Murray Bridge Branch and took charge of the meeting held on April 20th. Excellent papers were contributed by Mr. C. Fahrmann, on ''Poultry on the Farm,'' and Mr. Hudd spoke on dairying.

THE PIG INDUSTRY.—At a further meeting on May 18th, the following paper was read by Mr. H. Brook:—Feeding is a very important aspect of pig management. Feed

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is cheap and plentiful at present, which makes pigs a paying proposition. For sty feeding grain is necessary to supply protein. The best grains are crushed wheat, peas, or barley. Milk and house slops supply the liquid needed. Good convenient markets are available for the right type of pigs. The climate is temperate, so that very little shelter is required. Keep all places clean in order to keep down diseases. In this district pigs should be regarded as a side line to dairying and wheat growing. Grain and milk are plentiful, so that the pigs can be fed cheaply. Water is very necessary to good health, and should always be available. Build sties in such a way as to provide for good drainage. A straw roof is preferred; it is warm in winter and cool in summer. Water trough can be made of wood or cement, both of which are cheap and lasting. Self feeders are only used wh[illegible]ing is carried on. Sties measuring 8ft. x 16ft. will be quite large enough. Floors should be 1in. to 1½in. higher in the sty to allow for drainage. Cleanliness is essential. Keep the sties and troughs clean and have regular feeding times. Do not feed too much at one meal. The trough should be about 10in. at top and not too deep. The Berkshire is the most popular breed, and the young pigs fatten quickly. These have small litters, but are quiet natured. Yorkshires need plenty of shelter, because they are subject to sunscald. Tamworths are slow fatteners; better results are secured if crossed with the Berkshire. The Poland China is more suitable for the bacon breed. The Tamworth crossed with the Mid-York produces excellent bacon pigs. The Tamworth is a prolific breed, and the sows are good mothers. Milk is an excellent food for pigs, and is especially suited for sows and young pigs. The boar has a marked influence on the quality of the litter. The boar should be chosen from a large litter, and have a masculine appearance.'' Mr. R. Cross read a paper, ''Preserving Wood and Metals.'' (Secretary, D. Harvey.)

MOUNT COMPASS.

June 2nd.

Annual Meeting.—Over 150 members and friends attended the fourth annual meeting of the Branch. The President (Mr. Antony S. Kidman) presided. A party from Victor Harbor, under the leadership of Mr. G. Solley, supplied musical and elocutionary items. To stimulate interest in the Bureau amongst junior members, the Branch has organised horse and cow judging and potato growing competitions. These were won by Masters M. Williamson, S. Miller, and K. Peters. Mr. H. M. Hale, of the Adelaide Museum, gave an instructive address, illustrated with lantern slides, on ''Reptiles and Fishes.'' The Vice-President (Mr. H. B. Peters), on behalf of the Branch handed the President (Mr. Kidman) a set of serviette rings and candlesticks. Mr. Kidman has set an excellent example to members, for during the past four years, in spite of the fact that his home is in Adelaide (40 miles away) he has not missed more than three or four meetings. The average attendance of members during the past year has been 41 at each meeting. (Secretary, C. Verco.)

MYPONGA (Average annual rainfall, 28.94ins.).

May 19th.—Present: 14 members and nine visitors.

Wool Classing.—The Hon. Secretary (Mr. C. Martin) read the following paper:—''The main points in classing wool are to see that each class is evenly matched and prepared in an attractive manner to place before the buyer, who will then purchase at the highest possible price with confidence. Some buyers only buy the best of wools —those containing the lightest and brightest fleeces—and such a buyer will pass an unclassed clip. It sometimes happens that a buyer is compelled to purchase wool that he does not want, on account of the lot being badly classed, and in consequence he will only give a reduced price because he must allow for the possibility of loss in reselling the wool he does not require. More often speculators buy up unclassed lines of wool, reclass them, and nearly always sell at a good profit. Classing assists the buyer to correctly estimate the yield of wool. Classing means dividing the clip into lots as will best meet the requirements of different wool buyers and in such a way as to enable them to most correctly ascertain the yield of clean scoured wool. Before classing, the fleeces are carefully skirted, all bellies, faulty, dirty wool and locks and stains removed. Then the fleece is rolled neatly, leaving the shoulder wool on the outside, this usually being the best wool of the fleece. To skirt a fleece, start behind the shoulder, taking off any dirty, faulty, or burry wool; work towards the neck, then turn and work back towards the breech; the latter wool is usually much stronger than the rest of the fleece, and in districts where burr or grass seeds are prevalent this portion of the fleece will be most affected. All burry wool should be removed and made into pieces. The four main factors in classing wool are condition, color, quality, strength and length of staple. Condition denotes the yolk and earthy matter which the fleeces contain. Merinos are chiefly classed on condition. Quality is a very important point which has to be taken nsideration, and means the fineness or coarseness of the fibre. Different wools ifferent spinning qualities, and each quality is used for a different class of l. Merino is the finest wool; the spinning quality starts [illegible] 60's, and goes s, sometimes to 80's. Crossbreds range from about 40's to [illegible]'s, and Lincolns 36's to 40's. Counts of spinning quality indicate the number of hanks of 560 that can be spun from 1lb. of scoured wool. Colour is another important item to sidered, although color and condition very often go together. The brighest fleeces enerally the lightest in condition. An exceptionally heavy fleece, in most cases, is yellow, and is called dingy. Rams' wool is very often light in color, but usually avy in condition. On no account should rams' wool or black or grey fleeces be in other classes. Rams' wool is much harder to scour than other wools. A fleece ning an excess of yolk is yellowish in color, and [illegible] heavy, although it will y scour white. Tick stains on wool caused by the parasite of that name, if stained y, will not scour out white. Much depends on the throwing of the fleece on to the e. If this is done well, the wool-roller can do his work quickly and correctly, and most of the second cuts and locks drop out of the fleece. When classing crossbreds, ke as few lines as possible. Three classes will generally cover all requirements:— Fine; (2) coarse; and (3) dingy and discolored fleeces and those which do not ch in the other two lines."

SHOAL BAY.

May 17th.—Present: 10 members.

R. W. Chapman brought forward the subject of the "cricket" pest now being rienced, and stated that he found that they not only lived in cracked ground and he grass itself, but in a loamy river soil they were burrowing under the earth and the roots of plants.

E SHOULDERS.—Mr. M. Havelburg said that sheepskin, with about 1½in. length of cut to the shape of the collar and put inside the lining, was a good preventive re shoulders. (Secretary, E. Bell, Wisanger.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
nman Valley	16/6/32	15	Paper—"Port Lincoln and District," F. Gore	H. Lewis
Jervois	14/7/32	31	Address—C. F. Anderson.	F. Baily
Ashbourne	20/7/32	19	Address—B. V. Crewe	H. Pitt
Belvidere	16/5/32	13	Annual Meeting	M. Pearce
Shoal Bay	12/7/32	6	Annual Meeting	E. Bell, Wisanger
Macclesfield	26/5/32	28	Address—R. Hill	H. Ross
Balhannah	17/6/32	16	Paper—"Bee-keeping," R. Nosworthy	C. Grasby
Balhannah	20/6/32	150	Cinema Lecture	C. Grasby
Balhannah	14/7/32	21	Annual Meeting	C. Grasby
Lenswood and Forest Range	27/6/32	14	Annual Meeting	B. Lawrance
Gumeracha	20/6/32	8	"Farming on an 80-acre Block," L. Wise	L. Wise
Longwood	18/6/32	12	Homestead Meeting	J. R. Coles
Longwood	16/7/32	11	Address—R. Scott	H. Haines
Springton	6/7/32	25	Visit to Onkaparinga	E. Brokate
Springton	13/7/32	9	Formal	E. Brokate
Blackheath	23/6/32	7	Paper from *Journal*	E. Paech
Langhorne's Ck.	12/7/32	11	Annual Meeting	P. Nurse
Mt. Compass	6/7/32	42	Address—R. Hill	C. Verco
Blackheath	21/7/32	9	Annual Meeting	E. Paech
Hindmarsh Is.	19/7/32	8	Question Box	H. Newell
Inman Valley	21/7/32	—	Annual Social	H. Lewis
Port Elliot	16/7/32	12	Annual Meeting	J. Colebatch, Victor Harbour
Mt. Pleasant	8/7/32	7	Annual Meeting	D. Smith
Kangarilla	22/7/32	10	Address—C. H. Beaumont	T. Golder
Cherry Gardens	16/7/32	17	"Dairying and Milk Testing," H. Lyndon	A. Stone

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When offered, full particulars will be published in the *Government Gazette*, and plans and detail may be obtained on application to the Director of Lands, Adelaide.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January [illegible] July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available [illegible] conditions under which they may be applied for.

Copies [illegible] may be obtained on application to the Director of Lands, [illegible], Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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All communications to be addressed:
"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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S. R. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, &c.

Eyre Peninsula (Eastern), at Kimba, Monday, October 3rd. (Secretary, Mr. M. J. H. Martin.)

Eyre Peninsula (Central), at Wudinna, Wednesday, October 5th. (Secretary, Mr. Duncan Duguid.)

Eyre Peninsula (Southern), at Cummins, Friday, October 7th. (Secretary, Mr. H. M. Roberts.)

Non-Irrigated Fruit Districts, at Tanunda—Lone Pine Branch, November 1st. (Secretary, Mr. T. Fromm, Tanunda.)

The opening session of each Conference will take place at 10.30 a.m. Papers, questions, &c., for Conferences should be forwarded to the General Secretary, Agricultural Bureau, about a fortnight before the dates mentioned above.

Christmas Gifts to the United Kingdom—Proposal of Australian Overseas Trade Publicity Committee.

The Minister for Commerce announces that the Australian Overseas Publicity Committee has framed proposals for the distribution in England and Scotland of Christmas parcels containing an assortment of Australian primary products. The parcels, in accordance with orders lodged in Australia, will be packed and despatched by the Committee's representatives in London.

In making available the details of the proposal, the Minister stated that the Trade Publicity Organisation was created some six years ago for the purpose of assisting the marketing of Australian products in Great Britain by means of advertisment and general publicity. The administration of the scheme was vested in a Committee in Australia which functioned in association with the Department of Commerce, and the executive work was carried out by a Director in London (Mr. A. E. Hyland).

The industries associated with the scheme were those of dried vine fruits (currants, sultanas, and lexias), dairying, canned fruits, fresh fruits (apples and pears), eggs, and honey, and the necessary finance was obtained by contributions from the industries concerned. The Commonwealth Government also contributed.

The Publicity Committee in deciding upon its Christmas Gifts scheme desired to provide an opportunity for the people of the Commonwealth to send to their relatives and friends in the United Kingdom a Christmas gift consisting of a variety of the choicest Australian products, and by doing so to bring these products more prominently before the buying public of the United Kingdom, thus securing an excellent means of advertisement.

The parcel will contain 2lbs. of sultanas, 2lbs. of currants, 1lb. of raisins, 2lbs. of butter, 1lb. of cheese, ½ dozen eggs, 1 tin of canned peaches, and 1 tin of canned pears. The total cost to the sender in Australia, including exchange and all delivery charges, will be 13s. 4d.

Orders for parcels may be lodged in all States, and in the case of the State of South Australia should be addressed to Mr. C. Harding Browne, Trustee Buildings, Grenfell Street, Adelaide. The orders should clearly indicate the names and addresses of both the sender and the recipient. Any further particulars may be obtained from the State representative referred to.

In the selection and purchase of the commodities required for the parcels, Mr. Hyland will have the assistance of officials of the Australian Marketing Boards and of the Commonwealth Government expert officers, and so there will be assured a freshly packed parcel of selected high quality articles.

The Minister said that he was confident that the people of Australia would welcome this opportunity of sending with very little trouble an excellent Christmas gift to their relatives and friends abroad. In addition to this personal aspect of the proposal, they would have the satisfaction of materially helping to bring about an expansion in the markets available for our products abroad—a very necessary requirement to the development of Australia's industry and trade.

The World's Wool.—Empire Marketing Board Survey.

The leading position of Australia among the producers of the World's Wool is clearly brought out in the Wool Survey which has just been issued by the Empire Marketing Board. The survey is a work of over 230 pages, published by H.M. Stationery Office, London, and priced at 2s. It estimates, country by country, the sheep population and wool crop of the world. Australia, with over 103,000,000 sheep is only equalled or surpassed by Russia. There are between 700,000,000 and 800,000,000 sheep in the world, a third of them in the British Empire. A census of the world production of wool shows Australia as the largest raw wool producer. Since 1924 Australia has provided a quarter of the world's wool, while the rest of the British Empire produces another quarter. The export trade and the trend of prices are next studied, and the survey also includes an account of the lesser animal fibres, mohair, cashmere, camel hair, alpaca, &c.

Prices.—The survey concludes that a large part of the price fall since the war has been due to the rise in the value of money, but adds that generally speaking wool prices have fluctuated more rapidly than the general commodity index. People economise on woollen garments and make them last longer. Demand is elastic, but the supply of wool is inelastic, so increased demand should show itself at once in the price. No large stocks have been allowed to accumulate through efforts to maintain prices.

Export Prospects.—Russian wool is almost entirely carpet wool, and the Russians import finer wools. The United States imports carpet wools. Neither of these great producing areas is likely to become an important exporter of wool in the near future.

Butterfat Output Competition.

Five years ago the United Dairy Cattle Breeders' Association of South Australia inaugurated an annual Butterfat Output Competition among those of its members whose herds were under official test, and during each year a gold medal has been presented to the owner of the winning herd.

The winners have been—

1927–28.	Mr. C. J. Morris, Monteith	556.58lbs. butterfat.
1928–29.	Mr. J. A. J. Pfitzner, Hampden	456.81lbs. butterfat.
1929–30.	Mr. C. J. Morris, Monteith	496.69lbs. butterfat.
1930–31.	Mr. C. J Morris, Monteith	465.21lbs. butterfat.
1931–32.	Mr. C. J. Morris, Monteith	560.94lbs. butterfat.

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DECORATION

A summary of the fifth year's competition is set out hereunder, and the conditions under which the competition was held were as follows:—

1. No herd of less than six cows was eligible to compete.
2. In a herd of more than six cows, 25 per cent. of the number did not compete.
3. At least one cow in every six or part thereof had to be a matured animal—five years or over at time of calving.
4. The handicaps were—

For cows under two years at calving	80lbs. butterfat.
Two years but under three years at calving	60lbs. butterfat.
Three years but under four years at calving	40lbs. butterfat.
Four years but under five years at calving	20lbs. butterfat.
Five years and over at calving	Nil.

Breeders.	Total Cows.		Mature Cows.	Butterfat Produced.	Handicap.	Total Butterfat.	Average per Cow.	Position.
	Competing.	Discarded.						
				lbs.	lbs.	lbs.	lbs.	
Morris, C. J.	15	5	10	8,194·04	220	8,414·04	560·94	1
Giles, L. H. & P. C.	6	2	2	2,829·03	120	2,949·03	491·51	2
Mountstephen, H.	9	3	4	4,112·63	140	4,252·63	472·52	3
Verco, C. E.	7	2	2	3,029·22	260	3,289·22	469·89	4
Pfitzner, J. A. J.	11	3	6	4,783·77	280	5,063·77	460·34	5
McEwin, J.	6	1	2	2,508·80	200	2,708·80	451·47	6
Eckermann, W. P.	9	3	3	3,657·73	320	3,977·73	441·97	7
Pfitzner, E. W.	6	2	2	2,412·54	220	2,632·54	438·76	8
Sieber, A. B.	8	2	3	3,159·57	340	3,499·57	437·45	9
Hawker, W.	8	2	3	3,246·92	200	3,446·92	430·87	10
Middleton, A. E.	7	2	2	2,612·19	280	2,892·19	413·17	11
Pool, W. A.	7	2	2	2,512·56	260	2,772·56	396·08	12
Ottens, C. C. T.	6	—	3	2,172·49	180	2,352·49	392·08	13
Coleman, F.	17	5	7	6,021·49	600	6,621·49	389·50	14
Nicholls, E. & A.	9	3	2	3,181·00	320	3,501·00	389·00	15
Walsh, H. R.	9	3	4	3,152·07	320	3,472·07	385·79	16
Ansell, Mrs. C. W.	9	3	4	3,149·22	300	3,449·22	383·25	17
Hudd, J. M.	7	2	2	2,379·31	220	2,599·31	371·33	18
Neumann, Mrs. M.	6	1	3	1,996·77	180	2,176·77	362·80	19
Brooks, T. B.	6	1	2	1,965·65	180	2,145·65	357·61	20
Marrett, A. J.	9	3	4	2,982·89	200	3,182·89	353·66	21
Bohme, H. & A.	6	—	2	1,857·53	220	2,077·53	346·26	22
Traeger, E. O.	6	1	2	1,874·66	200	2,074 66	345·78	23
Snell, A.	9	3	4	2,927·10	140	3,067·10	340·79	24
Agric. College	22	7	6	6,758·53	700	7,458·53	339·02	25
Kybybolite Farm	27	9	7	7,913·93	940	8,853·93	327·92	26
Manool, A. J.	6	1	2	1,779·80	120	1,899·80	316·63	27
Insp.-Gen. of Hosp.	14	4	5	3,804·36	400	4,204·36	300·31	28
Kuchel, H. B.	6	—	3	1,666·67	80	1,746·67	291·11	29
Robinson, J. O.	9	3	5	1,978·99	160	2,138·99	237·67	30
Cowan, M.	6	1	3	1,218·12	140	1,358·12	226·35	31
Ayrbrook Farm	6	—	2	1,000·58	160	1,160·58	193·43	32

NOTE.—Messrs. J. H. Dawkins, W. S. McAuliffe, and the Dunleith Pastoral Company submitted more than six cows to official test, but did not have sufficient matured cows for eligibility.

Publications Received.

Royal Agricultural College Students' Magazine, Cirencester, Vol. XIX., Part I. In an accompanying letter the editor mentions that owing to the war the college closed down for a number of years and lost touch with numbers of its old students, from whom their *Alma Mater* would like to receive some news.

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AGRICULTURAL INQUIRIES.

[*Replies supplied by Mr. W. J. Spafford, Deputy Director of Agriculture.*]

Soursobs in Cereal Crops.

Wasleys Agricultural Bureau: Is oxalic acid in soursobs detrimental to the growth of cereal crops? Reply—Soursobs when present retard the growth of cereal crops because of the fact that they use mineral plant food and moisture required by the crops, but the oxalic acid manufactured by the soursobs during their growth would immediately be changed on the death of the plants (*a*) by the decomposition of the organic matter, and (*b*) by combination with mineral constituents of the soil. If soursobs were grown in a soil for such a length of time that the acid produced led to the soil becoming sour, then the growth of cereal crops would be affected injuriously, but it is difficult to imagine how long it would take for this to happen in the soils in which soursobs flourish, because most of them are well supplied with lime to counteract excessive acidity.

Stage at which to Cut Hay.

Blackheath Agricultural Bureau: At what stage should one cut wheaten or oaten hay for feeding to milking cows chaffed, to produce the maximum return of milk? Reply—In districts where the climatic conditions are such that cereal hay can be properly cured in late September or early October, wheat and oats grown for hay for cows should be cut soon after flowering and before the grains show much sign of development. Such hay has higher digestibility than that made from more mature crops, and is of a laxative nature, which also helps cows in milk. With such early-cut hay, more care is necessary in curing, because cool weather is sometimes experienced while it is in the stook, and there is then considerable liability of the development of moulds, and the blackening of some of the hay.

Storage of Oats.

Miltalie Agricultural Bureau: "Is it necessary to provide ventilation in an over-ground concrete silo in which oats are to be stored; if so, what method should be used?"

Reply—Success with storing grain in silos depends on drying the grain before shooting it into the receptacle, and then keeping *all air* away from the grain. No ventilation of any kind must be permitted, and, as a matter of fact, all masonry silos should be coated with whitewash, tar, pitch, bitumen, or some such substance before they are filled, to make certain that the receptacle is made airtight. Silos made of materials other than masonry should have any joints in the material coated with something that will make certain that no air gains admittance.

"Would a concrete floor in silo be all right for storing oats for a period of, say, four years, or would a wooden floor be necessary?"

Reply—Concrete floors in silos are quite suitable for storing grain for years provided that moisture is not rising through the floor.

Mangels.

Rendelsham Agricultural Bureau: "What is the best month to sow mangel seed?"

Reply—Mangels are summer-growing plants, and so the seed is sown in the spring. In seasons when the soil has warmed up in September the seed can be sown in that month, but when the cold weather continues into the spring it is better to wait until October. The so-called mangel seed is really a mass of corky material containing from three to five seeds. Usually, and particularly if the seed was soaked before sowing, all of the seeds in the capsules germinate, but on other occasions some of them germinate a long while before the remainder. It is essential to carefully thin out mangels before the young plants get too large, one of the main reasons being that the plants arising from a single capsule often twist themselves around one another and so lead to misshapen roots if left to mature.

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Strawberry Clover.

Brentwood Agricultural Bureau: "Is it possible to establish Strawberry Clover on the salty swamps in the district?"

Reply—Strawberry Clover will grow in fairly saline conditions, but in all probability most of the swamps near Brentwood are much too salty for this fodder plant. In those places, however, where the edible rush-like plant has appeared it would be well worth trying Strawberry Clover, and perhaps the best way to make the trial would be purchase a small quantity of seed. Scarify the seed by spreading it in a thin layer on a table or bench, and gently rub it with a board to which has been tacked or glued a sheet of sandpaper. Sow the seed in a plot that can be easily watered. Keep the plot well watered during spring, so that the plants make a dense mat of growth. Cut the plot of clover into small sods about 1in. to 1½ins. square with a sharp spade, and throw these sods into the mud of the swamp, trying to space them about 2ft. to 3ft. apart each way.

HORTICULTURAL INQUIRIES.

Dead Limbs in Apricot Trees.

At the Conference of Southern Branches of the Agricultural Bureau the following questions were included on the Agenda and replies supplied by Mr. C. H. Beaumont, District Horticultural Instructor:—

"What is the cause of apricot trees dying in the Strathalbyn district and the remedy for same?"

Reply—There are several causes for this trouble, but the main reason in the Strathalbyn district is the shallow soil and tight red clay subsoil. The trees will not live to any great age in such a soil. Another reason may be a want of water or too much water, both having a similar effect. Further, the trouble may be the result of very heavy pruning; this causes a gumming, and it is probable that a bacterial action may cause limbs to die.

Borers Attacking Fruit Trees.

"What is the correct time to spray prune trees to prevent borers attacking the fruit?"

Reply—Spray as soon as the caterpillars are noticed; this, however, may not be at the same time every year.

Crown Gall.

"Cause and treatment of the swelling cancer on the main stems of almond trees?"

Reply—The swelling is caused by "Crown Gall," or "Plant Cancer." There is no cure for it in the later stages, but it may be stopped if observed on trees up to 3 or 4 years old by cutting out the cancer with a sharp chisel and painting the wound with white lead. Other trees are affected in the following order:—Peaches, plums, pears, and it is seen occasionally on the apple and vine. It is considered to be mainly a nursery trouble, and the trees are affected before planting out. It is always worse in sandy soils.

Pruning.

"What will be the effect on matured fruit trees if the leaders are not pruned?"

Reply—There would be no special effect except that the spindly growth would be broken off by the wind and thus perhaps seriously damage the tree.

Cincturing.

Speaking of his observations in the vineyards in the Langhorne's Creek district, Mr. C. H. Beaumont, in a short address at the Southern Conference, said he was surprised to see the damage done to vines, especially Zante currants by twisting the young vines on

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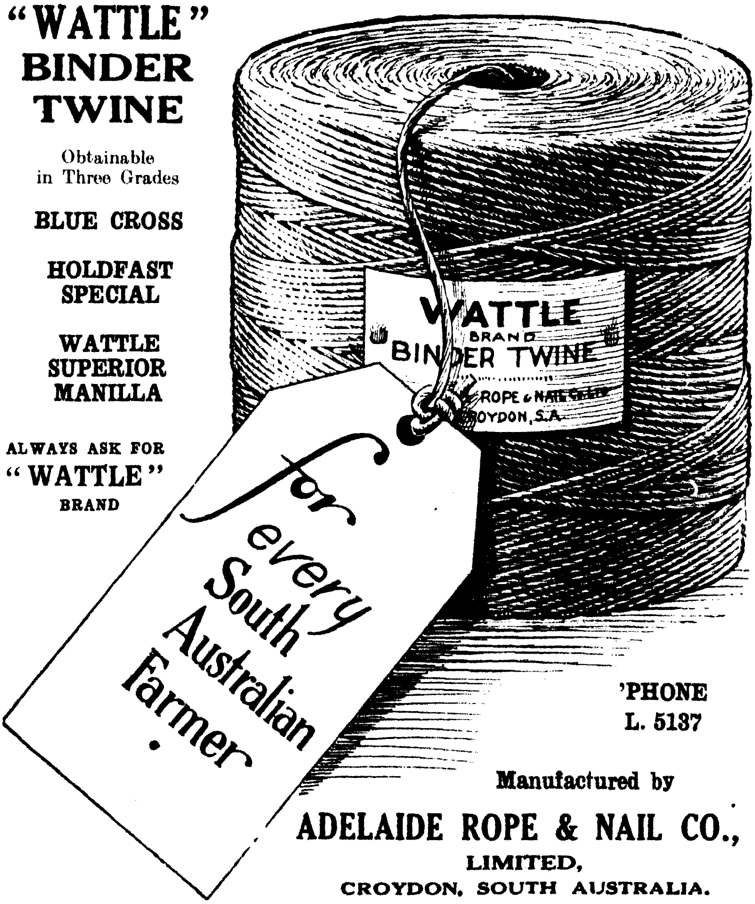

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the trellis vines and failing to remove them; the vine was thus practically cut into sections by the constriction caused by the wires, and some thousands of vines had died in the past dry seasons. This may have been caused to some extent by careless cincturing. Some growers made a deep cut into the main stem and then wondered at the weak condition of the vine. The cut is needed *through the bark only,* and the bark is very thin. It is advisable to get the vines off the wires and tie them in place, taking care when cincturing, or the whole vineyard will die out.

VETERINARY INQUIRIES.

[*Replies supplied by Veterinary Officers, Stock and Brands Department.*]

Lameroo reports stallion in good condition, but lacking in vitality. Reply—Do not use stallion for service for a couple of weeks. During this period give one teaspoonful of powdered nux vomica night and morning for seven days. To give, mix with treacle and smear on tongue. Give four feeds daily of oaten chaff and bran and crushed oats. Do not over-feed. See that horse gets plenty of exercise each day and regular green feed. When using again limit service to one per day.

Paruna asks must a sheep earmark be registered? Reply—Sheep earmarks are not registered, the owner of a registered sheep brand being permitted to use any earmark he desires provided that pliers are used and the mark does not exceed the regulation size of ¾in. x ½in., except in the case of a slit, which may be 1¼in. from the tip of the ear. It is contemplated introducing a Bill to provide for the registration of sheep earmarks.

Point McLeay asks for symptoms of pneumonia in cattle. Reply—The symptoms of all acute types of pneumonia (including pleuro-pneumonia) are:—Rapid breathing (the breathing is done mainly with the abdominal muscles), high temperature (105° to 107°), disinclination to move, head is poked out, appetite is lost or is poor, rapid falling off in milk supply, and an important symptom is the presence of a cough.

Naracoorte reports death of calves nine months old. Frothy discharge at back passage, practically unable to stand. Reply—The condition is digestive in origin and caused through improper feeding. It is suggested that the calves be put in a fresh paddock and that any that are not doing well be put on to whole milk for a week and then gradually put on to skim milk. The calves should be fed three times daily and should not receive too much at each feed. Change over to a good calf food (linseed meal) for a time. Keep utensils clean. If any calves are scouring, isolate, give a dose of castor oil, and put on to whole milk.

6, *Park Terrace, Parkside, asks information re registration of stallion.* Reply—It is not necessary for the draught stallion to be registered in a stud book. The fee for examination is one guinea per horse, plus cost of transport. No charge is made if the stallion is examined at annual stallion sale or Royal Agricultural Show.

Wolseley has mare nine years old, big eater, but is losing condition. Reply—(1) Starve for 18 hours. (2) At end of that time give following drench:—Raw linseed oil, 1½ pints; oil of turpentine, 4 tablespoonsful. (3) Subsequently give one tablespoonful of Fowler's solution of arsenic night and morning for a fortnight. To give mix in a small damped feed. (4) Feed four times daily on good quality chaff, bran, and crushed oats. (5) Have horse's teeth attended to if necessary.

Brentwood reports (1) *horses six and eight years with swollen gums;* (2) *Horse with sore in top of lip.* Replies—(1) Give affected horses the following drench:—Raw linseed oil, 1½ pints; oil of turpentine, 4 tablespoonsful. Have chaff damped. If molar teeth are irregular they should be filed. (2) The only effective treatment is to open up the sore with a clean sharp knife, search for any foreign body, and syringe wound out with lysol solution.

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Coomandook, two pigs, four months old, suddenly lost use of legs. Reply—The condition is paralysis. Put sows in warm, dry well bedded down shed. Feed on whole fresh milk and a little meat (rabbits, &c.), no grain. See that sows get plenty of green feed (grazing). Put a supply of wood ashes out for them.

Mount Gambier reports that all sheep on his property that at any time get their skin broken develop tetanus. Reply—Be very careful at "marking" and "shearing" time. Temporary yards should be used for marking, and I would suggest that you try the Burdizzo pincers for both castration and tailing. All old sheep yards should be cleaned out, and litter, old manure, &c., burnt. The making of new yards should be considered. Anti-tetanic serum is very effective both as a prophylactic and a curative. For curative purposes, however, the cost is high. As a preventive for a sheep, 100 units (U.S.A.) should be injected subcutaneously as soon after the wound is received as is possible. As a curative for a sheep, 2,000 to 3,000 units should be injected subcutaneously. The later doses depend on course of the disease. Price:—One phial containing 500 units (U.S.A.) costs 1s. 6d. The serum can be obtained direct from the Chief Quarantine Officer (General), Peel Chambers, Peel Street, Adelaide. A hypodermic syringe and needles would be required. Should you require any further information get in touch with Mr. Curtis, Stock Inspector, Mount Gambier.

Macclesfield asks (1) *should a cow be dried off before calving, and* (2) *treatment for horse with itchy fetlock.* Replies—(1) It is advisable especially in case of a heavy milker. Do so six to eight weeks before calving. The cow can be served when she comes on heat (21 to 28 days after parturition). (2) Clip hair off fetlocks. Rub in following mixture daily with a brush:—Paraffin oil, 1 pint; solution of hard soap, 1 gallon. (Add paraffin oil to soap solution whilst hot. Keep mixture stirred whilst applying.)

Langhorne's Creek has horses troubled with lice. Reply—Treatment:—(1) Groom daily. (2) Feed well. (3) Apply one of the following dressings:—(*a*) paraffin oil, 1oz.; linseed oil, 19ozs.; (*b*) non-poisonous sheep dip (at strength recommended for dipping). Whatever dressing is used must be persisted in and repeated for several weeks in order to destroy fresh lice as they hatch out. The eggs are resistant to dressing. (4) Clean out stables thoroughly.

Bordertown reports mare stands with legs widely apart and rubs itself on the belly on rails. Reply—1. Try the following treatment:—(1) Starve for 18 hours. (2) At the end of that time give following drench:—Raw linseed oil, 1½ pints; oil of turpentine, 4 tablespoons; shake thoroughly before giving. (3) Subsequently give one tablespoonful of Fowler's solution of arsenic in a small damped feed night and morning for a fortnight.

Langhorne's Creek reports pigs with back passage protruding. Reply—The condition is due to some bowel irritation. See that the young pigs get plenty of exercise and grazing. Cut down supply of grain (barley). A good supply of wood charcoal should be made available to them. If condition continues report occurrence to us.

Ceduna asks for method to rear a foal by hand. Reply—The foal can be raised on cow's milk. Get milk from fresh cow and preferably one with milk of a low fat content. To prepare milk proceed as follows:—Dissolve one tablespoonful of sugar in a little warm water. Add three to five tablespoonsful of lime water, then enough milk to make a pint. Feed ¼ pint every hour for the first few days, always warming to blood heat. Use an ordinary baby's bottle and strong nipple. Wash after each feed. As foal grows increase amount of milk gradually (after a few days give six feeds and later only four). After three weeks discontinue sugar, but still add lime water. In five to six weeks sweet skim milk may be *gradually* substituted for whole milk, and after three months give foal all it will drink three times daily. At earliest possible age give foal solid food, *e.g.*, crushed oats, bran, and a little linseed meal. If scouring occurs give two to four tablespoonsful of equal parts of castor oil and olive oil. Cut out feed for three or four feeds.

THE MANUFACTURE AND UTILISATION OF SILAGE.

[By W. J. Spafford, Deputy Director of Agriculture.]

The storage of luscious green forage so that it retains its succulence, palatability, and digestibility is one of the recognised methods of preserving foodstuffs for farm livestock, and when saved in this form the fodder is known as Silage or Ensilage. It is by no means a new art to manufacture Silage successfully; in fact, it is very old, but was revived towards the end of the last century, and was then boomed, and made very rapid strides, mainly because the United States of America took it up seriously, after the appearance in that country in 1879 of the translation of a work on the subject written by M. Auguste Goffart in 1873, and of the "Book of Ensilage," by Dr. J. M. Bailey, of Boston, in 1880. Its manufacture made such rapid progress that in a very short time after the publication of the above works a conference of several hundreds of farmers was held in New York to compare their experiences of the fodder. That it is only the revival of an old art there is no doubt, because the ancient Romans left references to the storing of green fodder in underground chambers, and the Mexicans have for centuries stored, and are still storing, fodder in this way.

The credit for being the first man in Australia to store fodder as Silage is usually given to the late Mr. Charles Rake, of Enfield, South Australia, who not only manufactured it, but did his best to encourage others to make and use it. Despite this very early experience of Silage, and the fact that the comparative dryness of our climate favors such a foodstuff, it is only now becoming popular in this State, and although its value is now a little better known, much still remains to be done in this direction. It seems certain that if we are to make much progress with dairying, forage must be stored as Silage on practically all farms carrying milking cows. In many parts of the State we can produce with certainty very heavy growths of fodder plants, cereals, peas, and other leguminous crops in the Spring time, but they all quickly mature when the Summer season arrives, and from then until the Winter is over farm livestock are compelled to secure most of their sustenance as "dry" feed. The only green forage obtainable during this period is from the very limited area of irrigated fields, and from light grazings when the Summer rains have been exceptionally good, or when the Autumn rains are early enough to start the feed whilst the soil is still warm. The storage of some of the surplus forage in a succulent form for use during the period of "dry" feed keeps up the production of the dairy herd, and has the added advantage that the greater yield of milk is received during the time of normal shortage, when prices are at their highest.

The definition of the term "Silage" at the present day is the article obtained by storing green succulent forage so that it retains its succulence and much of its green color; and the word "silo" stands for the air-tight receptacle used for storing this succulent fodder.

Ensiling a fodder, or making Silage, consists in preserving green, succulent plants, so that they will remain green, or semi-green, and keep their succulence for a considerable time. Briefly, it is done by cutting the plant growth to be made into Silage when very green, and nutritious, and storing it under pressure, usually in air-tight receptacles of some kind, but sometimes in open stacks. Originally, Silage was always made in underground pits, the earliest ones being no more than holes in the ground; but later on these were improved by using masonry bottoms and sides. These underground chambers were followed by overhead receptacles, made of various materials, and these again by stacks made in the open air. In most cases considerable weight is applied. The resulting forage is of the same nature, whatever the system of manufacture, the difference between the various methods having to do mainly with the ease of handling the green stuff or the finished article, and with the amount of waste in preparation.

ADVANTAGES OF STORING FORAGE AS SILAGE.

When fed to dairy cows and ewes with lambs, good Silage has almost exactly the same nutritive value, pound for pound of dry matter supplied, as has green forage, and, as well as possessing equality with the best milk-producing foodstuffs, it has advantages over most other stored fodders. The palatability of practically all forage plants is increased by converting them into Silage, and so great is this palatability that animals which have been fed with the fodder will leave all other foodstuffs when good Silage is placed before them. The digestibility of most fodders is increased when they are stored as Silage in a proper manner, but its great advantage in this direction is that the digestibility of other foodstuffs fed in conjunction with it is also improved. This is particularly noticeable when Silage is given to animals grazing at the end of Summer and in the Autumn, on feed allowed to dry in the fields, or when they are only receiving hay as well as the Silage. Some of the forage plants not readily eaten by livestock because of the presence of spines, or tough fibres, and some of the rougher kinds, which will not cure into good hay, can be converted into Silage of fair quality, which will be readily eaten by the animals, and lead to a full milk flow.

Another great advantage of storing feed as Silage is that the job can be undertaken as soon as the crop is ready, without the need of waiting for fine weather. Provided really heavy rain is not falling at the time, the crops can be cut and carted to where the Silage is to be made, in any weather, and in those cases, when the crop is a little over-mature, some rain helps towards the production of first-class Silage. No matter how the Silage is made, no damage is done to it by birds or mice, and there is no danger from fire.

CHANGES OCCURRING IN THE MANUFACTURE OF SILAGE.

Considerable alterations occur in the forage between the cutting of the crop and its preservation as Silage, and the distinctive odor, peculiar flavor, increased palatability, softening of naturally tough fibres or spines, and the general attractiveness of the fodder are wholly due to these changes. As the changes are all-important in the manufacturing and also in the keeping of the fodder in a succulent form, some knowledge of them is necessary. The transformations that take place in forage stored as Silage are of both a chemical and a physical nature, but whilst the chemical changes are great and of much importance, the physical ones are only of minor account. Under all methods of making and storing this class of fodder, the alterations that occur are the same, but the degree of change varies with the method of manufacture adopted.

CHEMICAL CHANGES.

When green succulent growth is thrown together in a heap there is a rapid rise in temperature, and this increase of heat is brought about in the first place by the respiration of the live cells, and is continued after the death of the cells by fermentation and bacterial activities. The great bulk of the cells of green plants remain alive for some time after the plants are cut, and when thrown together in the heap these cells continue to breathe in oxygen and give off carbonic acid gas, and, as is the case with all other forms of life, in this process heat is evolved. These cells continue so to breathe while there is free oxygen present, and as soon as they have used all of this free oxygen, if the heat evolved is not sufficient to kill the cells, they begin extracting oxygen from their own materials, and this effort, combined with the rise in temperature, causes the death of the cells. The rise in temperature and death of the plant cells is a very rapid process, for there are millions of living cells thrown together in the mass, all breathing oxygen from a limited supply; and as the loss of heat from the mass is very slight, it is stored up, and the temperature quickly rises to the point necessary to kill the cells. It is not until after the plant cells are killed that the action of ferments and bacteria comes into really active play, but if sufficient free oxygen is present it will lead to so complete a decomposition of the material in the heap that it will soon be indistinguishable from well-rotted farmyard manure.

It is recognised that plants as they grow have the ferments and bacteria that will lead to their decomposition when suitable conditions offer, literally all over them. It is also known that the temperature surrounding these plants has only to be raised sufficiently high to kill all the plant cells, and the ferments and bacteria adhering to the outsides of the plants. Further, in all fermentative activities, each particular form of life attacks special portions of the organic matter, and produces as a result of its action a substance peculiar to its own kind. One of the commonest instances of this is the action of yeast, which attacks sugar in solutions, splitting it up and leaving alcohol behind. Now the product set free by each special kind of ferment or bacteria accumulates until in the end there is sufficient of it to act as a poison to the life that produced it, either killing or at least checking its activities. This is commonly seen with our friend the yeast in the making of sweet wines; here enough sugar is provided in the first place, so that the ferment produces sufficient alcohol to check its own activities, and the finished article has sugar left in it, although the yeast was not killed by artificial means.

It is having a knowledge of these above-mentioned natural activities and an understanding how to control them that enables the successful manufacture of good Silage with certainty, and the making of the particular type desired. When the temperature is allowed to rise rapidly to a point where the ferments and bacteria are rendered inactive before they have led to much splitting up of organic matter, with its resulting liberation of acids, what is known as "sweet" Silage is made. On the other hand, when the temperature is not allowed to rise high enough to kill the ferments and bacteria brought in with the green fodder, they continue their activities until the acids liberated by them have accumulated in sufficient quantities to stop their work, and then so-called "sour" Silage is the result.

It has been found (*) that practically all the free oxygen in the air surrounding the material being converted into Silage is used up in 4 or 5 hours, and the usual fermentation products—ethyl alcohol, acetic acid, and lactic acid—are present in appreciable quantities in from 24 to 48 hours after putting the forage together. As the activities of the plant cells weaken, moulds, yeasts, and bacteria become more animated; the moulds probably functioning for a few hours only; the yeasts disappearing in a few days; and the bacteria persisting for a good time longer. During these actions the temperature rises for about 15 days, and although decreasing after this time, remains fairly high for some months.

PHYSICAL CHANGES.

In the course of manufacturing Silage from green forage the color and general appearance of the plants undergo fairly considerable change, but in most other directions the physical changes are of little importance. Most Silage is of a brownish color, and this is practically always so when the temperature has been allowed to rise fairly high, when rather over-mature fodder is used, and when eight or more days are occupied in filling the silo or erecting the stack. When very sappy plants are put together quickly, and the Silage is heavily weighted down within a week of starting the silo or stack, the resulting material usually retains much of its natural green color. The weight of material, as well as the weights put on the top, squeezes the forage together and alters the general appearance of the plants by flattening them out. The ensiling process develops a peculiar but not unpleasant odor with nearly all fodders so preserved, but with some very sappy plants, or where the Silage is carelessly made, the odor formed can be extremely unpleasant to human beings. The peculiar odor of Silage, even when it has become rather strong and unpleasant, has no deterrent effect upon livestock, and as a matter of fact appears to be attractive to them. The taste of the forage is considerably altered in manufacture, varying, according to the method practised when making the Silage, from sharply acid to a sweetish-nutty flavor, but all forms are readily consumed by farm animals once they have tasted the Silage. The tissues of many plants are softened in the silo, and this is particularly noticeable with the spines of such plants as thistles of various kinds, which are thus converted into good forage. The fibre of most plants is rendered more digestible by the softening process referred to.

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* Wisconsin Agricultural Experiment Station.

LOSSES IN MANUFACTURING SILAGE.

When it is remembered that the cells of the plants go on living for some little time after being cut, and that on their death ferments and bacteria lead to a partial decomposition of the organic matter, it is easy to realise that even in a first class silo which is practically air-tight, there is some loss of material through these activities. This loss is intensified in all badly constructed silos, and wherever portion of the material is exposed to the air, as when the top of the Silage in a receptacle is left uncovered, and on all sides and the top of stacks of Silage. The losses due to the last efforts of the plant cells and to fermentation are unavoidable, but the losses due to exposure to air can be considerably reduced, except in the case of stacks. That these unavoidable losses are fairly considerable is shown in the following table, the results there set out having been secured at the Missouri Agricultural Experiment Station in experimental silos built for the purpose:—

TABLE I.—*Unavoidable Losses in Making Silage.**

Kind of Silage.	Dry Matter. Lbs.	Protein. Lbs.	Fat. Lbs.	Ash. Lbs.	Crude Fibre. Lbs.	Nitrogen-free Extract. Lbs.
Green Maize (20 Silos)—						
Put in Silo	3,835.08	250.50	64.96	175.87	622.67	2,730.66
Removed	3,681.33	260.69	78.76	196.00	664.13	2,448.28
Gain or Loss (%)	—4.01	+4.06	+24.96	+11.44	+6.66	—10.01
Shock Maize (13 Silos)—						
Put in Silo	2,950.60	261.62	70.32	145.07	568.19	1,905.20
Removed	2,657.12	228.96	74.64	162.03	533.72	1,656.96
Gain or Loss (%)	—9.95	—12.48	+6.14	+11.69	—6.07	—13.03
Various Crops† (6 Silos)—						
Put in Silo	997.62	48.44	15.45	41.66	137.55	756.51
Removed	817.39	29.84	12.32	35.11	117.50	621.93
Gain or Loss (%)	—18.06	—38.40	—20.26	—15.72	—14.58	—17.79
Peas and Oats (4 Silos)—						
Put in Silo	754.97	43.43	7.19	30.49	82.51	591.35
Removed	702.87	38.19	10.74	28.23	73.86	551.85
Gain or Loss (%)	—6.90	—12.07	+49.37	—7.41	—10.48	—6.68
Legumes (9 Silos)—						
Put in Silo	1,775.84	128.10	27.30	71.82	183.58	1,377.50
Removed	1,738.28	134.65	36.86	77.55	190.64	1,298.57
Gain or Loss (%)	—2.12	+5.11	+35.02	+7.98	+3.85	—5.73
Total of 54 Silos‡—						
Put in Silo	10,703.64	759.23	191.55	494.71	1,696.24	7,500.93
Removed	9,891.06	717.91	226.11	524.13	1,663.23	6,728.99
Gain or Loss (%)	—7.59	—5.44	+18.04	+5.94	—1.95	—10.29

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*"Silage Investigations," A. C. Ragsdale and C. W. Turner, University of Missouri, Research Bulletin 65.

† 2 silos Rye, 1 Wheat, 2 Sudan Grass, 1 Sunflowers.

‡ Includes 1 silo Maize and Soybeans, and 1 of Maize and Sunflowers not shown in Table.

MAKING SILAGE.

As has been already pointed out, when it is desired to preserve succulent fodder so that it remains in a succulent condition, the temperature to which the mass of green stuff rises must be controlled—

1. So that the bulk of the bacteria are killed along with the cells of the plants; or

2. So that the cells and most of the bacteria, except the lactic acid forming ones, are killed.

In the first case the temperature is allowed to get fairly high before being checked, and in the other the check is applied before the temperature gets high enough to kill all of the useful bacteria. It must be remembered that it is only necessary to put green succulent growth in a heap, and the temperature will rise, due to the combustion that takes place by the activities of the living cells and the bacteria; and the slower this mass is put together the greater will be the rise in temperature. This is only reasonable, because both the cells and bacteria are very active when the supply of oxygen is large, and when the green stuff is put together quickly the weight on the mass is rapidly increased, so compacting it that the air is squeezed out, with the resulting check on the oxygen-loving life. Briefly, then, in the making of Silage a mass of green forage is put together, and then weighted down to compact it together, to squeeze out the air, and to prevent any more air entering it.

There are various methods of making Silage, but it does not matter much which one is followed, provided that a few simple rules are observed, and general care is shown. There are some variations in procedure depending upon the type of crop being ensiled, but most crops are handled in a very similar manner.

WHEN TO CUT THE CROP BEING ENSILED.

The green forage to be preserved as Silage should be cut while it is still really succulent and is well supplied with live and active cells, and to ensure a good "cure" the cut material should be put in the silo or stack whilst fresh and unwilted. The only exceptions to this cutting in an early stage of maturity and rapid transference to the silo occur when dealing with excessively succulent and watery plants, such as rape, kale, cabbages, &c., which preserve much better if allowed to become more mature, and if some of the moisture is allowed to dry out of them.

Of the crops usually converted into Silage the cereals wheat, oats, barley, and rye are in the best stage for cutting from a week to a fortnight after the heads appear, and in this stage, no matter how luxuriant the growth, they usually contain the correct percentage of moisture to make good Silage. The cereals can be converted into Silage of good quality if cut before the heads appear, but more weight per acre is obtained by waiting, as the cereals continue to increase in weight until about three or four weeks after full bloom, although from then onwards a continuous loss takes place until maturity is reached. The leguminous crops—peas and beans—should be cut when the bottom leaves are commencing to go yellow, and when the seeds are about full size, but still soft. Lucerne, clovers, and similar plants should have passed the period of full bloom before being cut, as they are liable to be too succulent if cut sooner. Maize, sorghum, and Sudan grass are usually allowed to stand until the bottom leaves begin drying before cutting for Silage; and in the case of maize, the grains should still be doughy although their skins are glazed. Sunflowers should be showing color in most of the flower-heads before cutting. Grasses should be well out in head if the best Silage is to be made from them.

Immature growth of most crops tends to make Silage which is soft and mushy, and it is usually necessary to wilt it to some extent before carting, or to mix it with over-dry material of some kind. Over-mature crops are usually much too dry to make good Silage, and if to be used should be moistened with water whilst being put in the silo or stack, and more weight should be used than for material cut at the right stage.

FILLING THE SILO.

In all cases, except when over-succulent plants are being ensiled, the forage should be put into the silo whilst still fresh, and many makers of Silage go so far as to declare that it should not lie on the ground to wilt to the slightest extent, and on no account should cut material be allowed to lie overnight. Rain falling during Silage-making does no damage to the materials, and only causes the inconvenience natural to carrying out such a type of work in the rain.

Different types of Silage are made according as the forage is thrown together quickly or the receptacle is filled more slowly, and although the resulting material is of good feeding value whether made quickly or not, most makers favor the slower method. It is found that a nutty-flavored Silage with pleasant aroma, which will keep almost indefinitely, is manufactured when a given quantity of forage is put in the silo each day for a period of six to 12 days, and the weights are applied as soon as the filling is completed. A minimum of 3ft. and a maximum of 8ft. of material should be put into the silo each day, and if for any reason more than a couple of days are to elapse before more material can be added, weights of some kind should be placed on the Silage, and remain there until the work of filling can be continued. Some makers follow the practice of filling the silo in three or four stages, by about one-third filling the silo, leaving it for a couple of days, repeating the quantity and again allowing it to settle, completing the filling in the fourth stage, and then weighting it down. Extremely good Silage is made in this way, but it is not of such uniform quality throughout the mass as when a regular quantity of forage is added daily to the silo.

When the silo is filled quickly and the weights added soon, so much air is excluded from the lower parts that slow fermentation results, and although the forage retains its green color much better than if the receptacle is filled slowly, the attractiveness and general quality is not quite so good.

It is usually recommended to thoroughly trample the outside edges whilst the silo is being filled, but when the forage being converted into Silage is sufficiently succulent, when weights are to be applied, and particularly when the material is chaffed before being put into the silo, this practice can be dispensed with.

The lime-washing or tarring the inside of masonry silos before filling tends to make the walls more air-tight and to protect them from attack by the acids in the Silage.

Some care must be experienced in entering partly-filled silos before re-commencing filling in the morning because of the danger from poisonous gases, and some agitation of the stagnant air is often necessary, such as would happen by feeding forage into it, or if a blower is used, giving it a run for a short while.

If the forage is chaffed before being put into overhead silos, elevators or blowers can be used to convey it from the cutter to the silo. The blower is the most efficient method to deliver chaffed forage, but a great deal more power is required to drive it than if an elevator is used.

When filling a trench silo the conveyances bringing the forage should run into the silo on top of the material to help press it together. When the silo is about half-full it is an advantage to further consolidate the Silage, and it can be done by driving horses backwards and forwards over the forage. It is very important with this type of silo to see that the Silage does not shrink to such an extent, after it is covered, as to leave a hollow below ground-level as a basin to hold water. Because of this it is usual to take about a fortnight to complete the filling, so that it is well consolidated, and then on the last day of carting, the forage is mounded up to about 4ft. above ground level, and allowed three or four days to settle before the earth is thrown on top of it.

CHAFFED OR WHOLE MATERIAL FOR SILAGE.

Silage of the very best quality can be made whether the forage is chaffed or stored whole. Chaffing the material facilitates the filling and emptying of overhead silos, and is suited to some of the coarser forages, such as Maize, Sorghum, Sunflowers, &c., whereas whole material is essential for stacks, and is generally availed of for earth pits and trenches.

If to be chaffed, the forage is cut into lengths of about ½in. to ¾in., and is delivered to the silo by a blower or elevator. Coarse forages are chaffed by a Silage cutter, a machine with the blades fixed horizontally on a roller, and made specially for the purpose, whilst finer-textured plants can be cut with the ordinary cereal chaff-cutter. The chaffed material should be delivered over the centre of the silo to prevent the settling of the heavy sections on one side, and more even distribution is brought about if a bag shoot is used to carry the material well down the silo. Regular distribution of the material when filling the silo leads to a more even settling of the Silage, and so better quality throughout the mass. Because chaffed forage compacts together better than whole material, less weight is required than for long stuff.

When whole material is being put into a silo or stack some difficulty is experienced in distributing it evenly, but if Silage of regular quality throughout is to be produced, it is essential that every effort be made to spread the forage evenly. When the crop has been cut with a binder, the sheaves can be placed in silo or stack without cutting the strings, and provided more weight is used on the mass just as good a quality of Silage will be made as from loose material. The strings will remain sound for some years if the crop was not too succulent when cut, and while they remain intact the Silage can be removed without difficulty.

ADDITION OF WATER.

Although it is generally recognised that it is necessary for the forage to retain living plant cells when it is put in a silo or stock, if good Silage is to be made, it is now known that these living cells are not absolutely essential to success. Providing suitable bacteria are present, and sufficient moisture is contained by the forage, Silage of similar composition to that made in the ordinary way can be produced without the assistance of living cells. First-class Silage has been produced by inoculating sterilised forage with suitable bacteria, and making up its moisture content.

It has been known for some time that forage cut and dried, and then put in a silo with adequate water, will make a good Silage. About the same weight of water as the weight of the dried forage is necessary to enable the material to be adequately packed together, and to lead to sufficient fermentation to properly preserve it.

If for any reason the forage to be made into Silage has become too dry, it should be damped with water whilst being put in silo or stack, and enough water must be used to ensure the proper packing of the material. The amount of water to use varies with the dryness of the forage, and whether it is being stored in a receptacle or stack. There is practically no danger of using too much water when stack silage is being made, and less damage will be done to the silage by an over-supply than if too little is used. Care must be exercised, however, when wetting forage being stored in a receptacle, because if too much is used the excess collects at the bottom of the silo and spoils the layer of silage which is flooded. If sufficient water is used to make up the moisture-content of the forage to about 75 per cent. there will be no surplus of water, and first-class silage can be made from rather dry material.

Saturating the top layer of Silage with water on completing the filling of a silo is sometimes practised to help compact the top layer, exclude the air, and reduce the losses by decomposition. This practice is of advantage when forage a little on the dry side is being stored in this way.

COVERING THE SILAGE.

It is sometimes claimed that it is worth while covering the top of the Silage to reduce losses of material, but in practice it is found that there is no covering which will prevent all loss, and when forage of sufficient succulence is used it soon decomposes and mats together on the top and makes a good seal, without excessive loss of material. A layer of wet cocky-chaff or wet straw makes a good seal on the top of Silage and reduces the loss of better forage, but is not worth considering for the purpose unless easily secured.

If loose soil is to be used for weighting the Silage it is sometimes thought advisable to apply a thin layer of cocky-chaff or straw before putting on the weight, but considering that a few inches of the Silage must be thrown away in any case, the practice is hardly warranted.

WEIGHTING THE SILAGE.

First class Silage of even quality throughout the mass, which will keep for a long period of time can only be made if the material is regularly squeezed together in some way, and this application of pressure is essential whether the Silage is being made in overhead silos, pit or trench silos, or in stacks. In some high, relatively narrow vertical silos in which chaffed forage is stored as Silage, it is often considered a more economical proposition to leave the mass unweighted, although it is recognised that there will be more loss of material at the top, and for some distance down the quality will not be so good as at greater depths. The higher the silo the less the need for adding weights, because the weight of the material itself consolidates all forage except the immediate top layers.

In all cases of silage-making, except when being manufactured in earth pits or trenches, weights should be applied immediately on completion of putting the forage together. Some makers go so far as to say that when building stacks of Silage, wires, to which weights are attached, should be thrown over the stack each night, and remain in position until more material is to be put on the stack. This precaution probably leads to the manufacture of a better article, but the advantage gained is so slight where some forage is put on the stack each day, that the trouble necessary to weight the stack every night is not warranted. If periods of three days or more are to elapse between additions of forage to the stack, then the temporary weighting down with something attached to wires is justified. In the case of earth pits or trenches, sufficient material must be put in the silo, so that after settling and covering a slight mound remains, and to make certain of this the filling is completed by piling forage 4ft. or 5ft. above ground level. The Silage in these silos is usually covered and weighted with soil removed from the hole, and as the easiest way to put the soil in position is with a scoop, it is usual to allow the silage to settle for a few days before weighting.

The amount of weight required to properly consolidate Silage varies with the method of manufacture. In tall, relatively narrow, vertical silos, weights equalling about 100lbs. per square foot of top surface should be applied. In comparatively shallow pits and trenches the weights should be increased to about 200lbs. per square foot, whilst for stack Silage much more weight is required, and the amount should be between 300lbs. and 400lbs. per square foot of top surface if best results are to be obtained.

Numerous contrivances have been invented for replacing weights on Silag stacks, most of them consisting of wire ropes and winding gear, but it is generally recognised nowadays that constant pressure is necessary for best results, and that any system requiring daily attention can only be fairly satisfactory. The regular pressure required is secured for a certainty when dead weight of some kind is placed on top of the forage. For the purpose articles usually found on farms, such as stones, earth, logs, fencing posts, scrap iron, and bags of sand are quite suitable, as are also concrete and mortar blocks.

Probably there is no more suitable article to use for weighting down Silage than rough stones of a size readily handled and thrown by a man. Provided really large stones are not used they are easily tossed on to the Silage, are convenient for stacking, do not dirty the Silage, are readily thrown out of the silo or off the stack, and are not difficult to move from place to place if the Silage stack is not settling regularly. Earth has some advantages as a weight for Silage, and is particularly suitable for silos, but if to be used on stacks it is necessary to fix a framework of some sort near the edges to keep the soil in position, and even then it is extremely difficult to get sufficient weight near the outside of the stack. Wire-netting, timbers (such as railway sleepers, wired together), bags of sand, &c., all make suitable frames to hold the earth. The silo or Silage stack is a convenient place to store fencing posts, logs, and rough timber generally, and they all weight down the forage efficiently, but are rather heavy to handle, and often demand gear to aid in lifting to high stacks or silos. Concrete or mortar blocks make suitable weights, and last almost indefinitely if handled carefully.

To be able to calculate the weight being used by a given depth of any of the above-menioned materials the following figures can be used:—

TABLE II.—*Weights of Materials for Weighting Silage.*

Materials.	Weight per Cubic Foot.	Depth of Material to give Sufficient Weight per Square Foot.		
		Deep Silos. 100lbs.	Shallow Silos. 200lbs.	Stacks. 300-400lbs.
	About	About	About	About
Stones (and concrete)	140lbs.	9in.	17in.	26 to 34in.
Sand	90lbs.	13in.	27in.	40 to 53in.
Loam	80lbs.	15in.	30in.	45 to 60in.
Clay	70lbs.	17in.	34in.	51 to 69in.
Timber	60lbs.	20in.	40in.	60 to 80in.

It is as well to remember that really good Silage can be made with considerably less weight than is shown above, but the nearer these figures are approached the better the resulting forage is likely to be.

SWEET OR SOUR SILAGE.

Two distinct kinds of Silage are produced from all fodders suitable for storing as Silage according to the method of manufacture followed. On the one hand what is known as "sweet" Silage is made, or if other practices are followed the Silage will be "sour." Both types are good, but they each have their advocates, some of whom are very strong in their preference for their particular fancy.

"Sweet" Silage is obtained by allowing the temperature of the material to rise to somewhere about 120° to 130° F. before checking it by applying weights to squeeze out the surplus air. Whilst the Silage is being made this control of temperature is done by putting more forage in the silo or stack, and when all the forage is in, other materials are used as weights. The temperature rises to the desired extent by allowing the access of plenty of air into the mass of forage, and is prevented from exceeding the useful temperature by removing the oxygen. In practice no thermometer is used, and one is not necessary, because experience shows that in a climate such as that of South Australia, if from 3ft. to 8ft. of succulent forage is put in a silo or stack each day for a period of six to 12 days, and weights are applied immediately on completion of the silo or stack, "sweet" Silage of high quality will result.

When the temperature of the forage is not allowed to exceed 120° F. "sour" Silage is made. This is brought about by limiting the amount of air in the forage, and is done in practice by throwing the material being ensiled into the silo or stack as quickly as possible, and immediately weighting it down.

In all silos, and in most well-made stacks, sour Silage is found at the bottom, whilst the top is usually over-fermented, because of the presence of an excessive supply of air.

As foodstuffs, there appears to be little to choose between these two forms of Silage, despite the exaggerated statements of their particular advocates, and the type of Silage to be made will usually depend upon circumstances. If plenty of help is available, and it is desired to get the job of Silage-making out of the way, the forage will be thrown together quickly and "sour" Silage will result, but where the saving of time is not so important, and where labor is short, the job will last longer and "sweet" Silage will be made.

When making "sour" Silage, care must be exercised if immature plants or very sappy forage are being stored, because if the fermentation of such materials is delayed to too great an extent, butyric acid is formed in quantity after the completion of the fermentations leading to the formation of lactic and acetic acids. The presence of much butyric acid gives the Silage a very objectionable odor, which might lead to the tainting of milk, and livestock do not eat the forage at all readily.

In endeavoring to produce "sweet" Silage, overheating of the material through excessive aeration must be guarded against, for in extreme cases it will lead to charring the forage, and consequently heavy loss of material and lowered nutritive value. This will only happen if over-mature or partially dried forage is being stored without the addition of water, or if the filling of the silo or building of the stack is delayed for some days without weights being used to keep down the temperature.

In practice it is found that there is less danger of making mistakes when manufacturing "sweet" Silage, and, as it is also less objectionable to humans, and is favored by livestock, it is better to try to produce this form of Silage rather than risk securing a really good "sour" Silage.

FODDERS USED FOR SILAGE.

The erroneous notion that almost any vegetable growth will make good Silage still persists in many quarters, but it is far from the truth, and anyone embarking on Silage-making activities must remember that (1) only good fodder will make good Silage, and (2) the better the fodder the better the Silage made from it. Ensiling some few plants which are more or less useless as forage, because of spines and coarse, tough tissues, such as Wild Artichoke (*Cynara cardunculus*), Spear Thistle (*Cirsium lanceolatum*), Slender Thistle (*Carduus tenuiflorus*), Milk Thistle (*Silybum marianum*), Yellow Cockspur (*Centaurea solstitialis*), Maltese

Cockspur (*Centaurea melitensis*), Buckbush (*Salsola kali*), and Furze (*Ulex europaeus*), converts them into useful forage through softening the objectionable tissues. Some weeds which are disliked by livestock because of the presence of many hairs, or the possession of a disagreeable taste, are considerably improved when converted into Silage, particularly when they are mixed with better forage plants in the silo or stack. Despite these few happenings, Silage-making must not be looked upon as a method of *making* forage, and should only be considered as a means of *storing* fodders, so that they retain their succulence and much of their nutriment.

Remembering that most plants which are fodder for livestock when in the green state can be stored as Silage if handled in the correct manner, and that the better the forage to be conserved in this way the better the quality of the resulting Silage, the plants to be used for the purpose will depend wholly on what can be grown to best advantage in the particular climatic conditions obtaining. The principal considerations in this direction will always be yield, succulence, palatability, nutriment, flavor, and odor.

Relatively coarse, strong-growing forage crops, such as Maize, Sorghum, and Sunflowers, are ideally suited for conversion into Silage, and where they can be successfully grown, give higher yields of fodder than the finer-stemmed forage plants. Throughout the world Maize is the principal crop stored as Silage, and it is generally recognised that where this crop can be grown well others are not considered to any great extent, but in South Australia other crops are likely to be of more importance, because in most parts of the State heavy crops of Maize cannot be grown with certainty every year.

The principal forage crops that can be handled with advantage as Silage in similar conditions to those obtaining in South Australia are described below.

COARSE-STEMMED FODDER PLANTS FOR SILAGE.

Of the coarse-stemmed fodder plants capable of giving heavy yields of forage in our climate, Maize, Sorghum, Sudan Grass, and Sunflowers are the most important.

Maize.

Maize can be grown really well where irrigation water is available, but in other places is a rather uncertain crop. Where sufficient water is under control to permit of liberal irrigation, Maize should be sown in rows about 30in. apart, using about a bushel of seed and 2cwts. Superphosphate per acre, the seeding being done as soon as the soil has warmed up in the Spring—say in October. When the rows of Maize plants are visible the land between the rows should be cultivated with a horse-hoe. Whenever the plants require water, the land should be furrowed out with the horse-hoe, and as soon after an irrigation as the soil dries out sufficiently to admit of the tramping of a horse the furrows should be cultivated.

Sorghum.

There is very little difference in the quality of Silage made from Maize or Sorghum, and although the former plant usually gives the highest yield of forage, Sorghum can produce full crops on less water than can Maize. Where the irrigation water is limited, Sorghum seed can be sown in October in rows about 30in. apart, using about 12lbs. of seed and 2cwts. Superphosphate to the acre. The crop should be irrigated when required with as much water as is available, and the land between the rows should be kept cultivated.

Sudan Grass.

Sudan grass is an annual sorghum which produces several fine-textured stalks rather than a few coarse stems, as is usual with the ordinary forage sorghums. It grows well enough in all parts of the State receiving 25in. or more of average annual rainfall to give regular crops of forage for Silage. In really fertile soil in districts with about 30in. of average annual rainfall, it can be succesgrown by broadcasting seed at the rate of 10lbs. per acre in October, and applying about 1½cwts. of Superphosphate per acre, but in districts with lower rainfall better results follow drilling about 7lbs. seed and 1½cwts. of Superphosphate to the acre in rows about 30in. apart, and keeping the land between the rows well cultivated throughout the growing period of the crop.

SUNFLOWERS.

It is possible to grow good crops of Sunflowers on much less rain than is necessary for Maize or any of the Sorghums, and the crop also does better where the weather is too cold or the season too short for these warmth-loving crops. Sunflower seed, at the rate of 15lbs. per acre, is, during September-October, drilled into rows about 24in. to 30in. apart, and about 2cwts. Superphosphate per acre is drilled in at the same time. While the plants are small enough the land between the rows is kept cultivated by the use of a horse-hoe.

From "Making Silage in Manitoba."

Sunflowers make good Silage, and although not so palatable as that made with maize, dairy cows keep up their milk flow on this forage almost as well as on maize Silage. The illustration shows a crop of sunflowers which yielded 30 tons of green forage per acre.

CEREAL CROPS FOR SILAGE.

In those portions of countries with a semi-arid climate, which have no supplies of water suitable for irrigation, the cereals can be grown with more certainty than can any other kind of crop, and as all of the cereals can be converted into good Silage, this type of crop will always be important if Silage-making becomes popular. In South Australia all of the cereals—wheat, oats, barley, and rye—can be grown to produce heavy, luxuriant crops suitable for Silage, and little more is necessary to ensure success than to fallow the land well, use plenty of superphosphate, and sow the seed early.

WHEAT.

Early wheats, such as King's White, Sultan, or Felix, produce very heavy crops which make good Silage, and should be sown at the rate of 100lbs. to 120lbs. of seed with 2cwts. Superphosphate per acre. Strong-growing wheats, such as Ford, Daphne, and German Wonder, should be seeded at the rate of 90lbs. to 100lbs. per acre. With all Wheats it is essential that they be seeded early in the season if they are to produce the very heavy crops required. When the seeding season opens in April the mid-season wheats can be sown, but in those years when the opening rains do not come before mid-May only very early varieties should be sown.

OATS.

Of the varieties of Oats commonly grown, Sunrise, Algerian, Lachlan, Bathurst Early, and Early Burt are all suitable for Silage crops, and should be seeded as early as possible at the rate of 80lbs. to 100lbs. per acre.

BARLEY.

Both Roseworthy Oregon and Shorthead Barleys make sufficiently luxuriant growth for Silage if started early in the season. They should be sown at the rate of 60lbs. to 70lbs. per acre.

RYE.

Rye is the best cereal to grow for Silage in cold wet locations and on sandy soils. All varieties make strong growth if germinated early, but of those known in this State, perhaps Giant Winter would prove the most suitable.

MIXED CEREALS.

Mixtures of the cereals generally make stronger growth than the separate kinds when grown alone, and these mixtures make first class Silage. Ford or German Wonder Wheat can be mixed with Sunrise, Algerian, or Lachlan Oats, and King's White Wheat and Early Burt Oats mature together. In wheat and oat mixtures grown for Silage about a bushel of seed of each should be used per acre. King's White Wheat can be mixed with either Roseworthy Oregon or Shorthead Barley, using about 50lbs. Wheat and 40lbs. of Barley to the acre. King's White Wheat, Early Burt Oats, and Roseworthy Oregon Barley can be mixed together at the rate of 40lbs., 30lbs., and 30lbs., respectively, and that quantity used per acre.

LEGUMINOUS CROPS FOR SILAGE.

Where a large assortment of forage plants can be successfully grown it is usual to look upon the fine-stemmed leguminous plants as being too good to convert into Silage, and they are cured and stored as hay. In an agricultural country with rather severe climatic conditions, however, where only a limited number of fodder plants grow luxuriantly, this does not apply, and if succulent feed is to be provided for the farm livestock throughout the year, portion of any forage crop which will grow well, whether it be a legume or not, must be stored as Silage. It is recognised that in making Silage of leguminous plants the loss of protein—the most valuable of the constituents of a foodstuff—is very great; still, it is usually worth while, because without succulent feed full returns cannot be secured from farm animals, and more particularly from dairy cows.

The leguminous crops which can be successfully grown in the State, and which can be converted into Silage of high quality, are Lucerne, Subterranean Clover, and Field Peas.

LUCERNE.

In all portions of South Australia where irrigation water is available and where the soils are of a non-acid type, Lucerne gives heavy yields of forage. The crop also grows well enough to enable growers to cut it several times during the season, even without irrigaton, in many places where the watertable is not too far from the surface. Although there is fairly heavy loss of nutriment in manufacture, Lucerne makes first class Silage, and whilst being fed with it dairy cattle require no proteinous concentrates. The best Lucerne Silage is made if the crop is cut when it has just reached the full-flowering stage and is chaffed into a silo, but good Silage is made from this crop whether it is stored in an overhead silo, trench, pit, or stack, and whether it is chaffed or preserved whole.

SUBTERRANEAN CLOVER.

Where conditions are favorable Subterranean Clover produces heavy crops of forage which can be manufactured into a really high-class Silage. Strong growth is made by this crop in almost all soils situated in countries where the climate is of a cool temperate nature, and where the average rainfall is 20in. or more per annum. This clover does not require much lime in the soil, as is usual with most clovers, but it will not make strong growth unless plenty of phosphatic fertiliser of some kind is applied.

FIELD PEAS.

The only leguminous crop which can be grown for a certainty in the principal wheat-growing districts of this State, *i.e.*, those districts receiving 18in. or more of average annual rainfall, is Field Peas. This crop when well grown makes first-class Silage, but because of the length of its stalks and their tendency to become tangled together, it is a very difficult crop to handle with ordinary harvesting machinery. Seed should be sown in May in most districts, at the rate of two bushels per acre, with the addition of 1½cwts. of Superphosphate.

PASTURE PLANTS AND WEEDS FOR SILAGE.

The pastures which follow the cereal crops are usually composed of plants which make really good Silage. The commonest pasture mixture which is to be found in the Wheat-growing districts of the State consists of a mixture of Burr Clover (*Medicago denticulata*), Barley Grass (*Hordeum murinum*), and Cape Dandelion (*Cryptostemma calendulaceum*), the proportion of the different plants varying according to season, but however the mixture might vary, really good Silage can be made from the growth. To get good results from this pasture, it should be cut and ensiled at about the time that the Barley Grass is heading.

In some cultivated districts, Wild Oats (*Avena fatua*) grow in association with Burr Clover, Barley Grass, and Cape Dandelion, and in others it is the predominating weed which follows cereal crops. Wild Oats make really good Silage if cut after heading and before seed is formed, and where this plant forms an important part of the growth to be stored as Silage, the time of cutting is decided by the maturity of the Wild Oats.

The Binder with canvasses removed makes an excellent machine for cutting pasture crops for Silage, as all material is left in narrow windrows easily picked up for carting to silo or stack. Used by Mr. J. H. Dawkins, Gawler River.

Weeds with spines like the thistles, or with tough fibres like buck-bush and furze, make very fair Silage if mixed in the silo or stack with good forage plants. Weeds such as mustard, charlock, turnip, &c., with objectionable flavors, should be used sparingly for Silage making, but provided that they do not form more than about 15 per cent. of the mass are converted into fair forage.

Very succulent plants such as rape, kale, cabbage, silver beet, beet tops, &c., are seldom stored as Silage, but it is possible to do so with some success if they are packed in alternate layers with cereal straw, or other dry forage.

YIELDS OF CROPS GROWN FOR SILAGE.

The yields of crops of all kinds vary very considerably according to conditions and treatment, and as it is desirable to get very bulky crops for conversion into Silage, and as coarseness of stem is not a disadvantage, every effort should be made to encourage the crops to make strong luxuriant growth. In this climate every advantage should be taken of available irrigation water, because very heavy crops of summer-growing forages can be procured, and be stored for use in the winter, when the supply of green fodder is short. With all crops being grown for Silage the soil should be thoroughly prepared before seeding, and where irrigation is not practised the land should be bare-fallowed beforehand. At seeding time liberal applications of Superphosphate should be given, for without it no crop gives full growth in these conditions. Plenty of seed should be used, particularly with the cereals sown in the Autumn, as the competition of plants close together encourages them to grow upwards with more rapidity, and over-luxuriance is not a disadvantage in a Silage crop. As most annual plants likely to be grown for Silage continue to increase in weight for a week or so after flowering, in this climate, higher returns will be secured per acre, if the crops are cut about 8 to 10 days after flowering.

The following table gives some idea of what can be expected from the principal Silage crops which can be successfully grown in South Australia.

TABLE III.—*Weights of Silage Crops.*

YIELDS TO BE EXPECTED UNDER NORMAL FARMING PRACTICES IN SOUTH AUSTRALIA.

Silage Crop.	Yield Per Acre. Tons.
Maize, Sorghum (irrigated)	20 to 30
Maize, Sorghum (not irrigated)	9 to 12
Sudan Grass	8 to 12
Sunflowers	12 to 25
Wheat (on fallow)	6 to 10
Oats (on fallow)	6 to 10
Barley (on fallow)	5 to 8
Rye (on fallow)	6 to 10
Peas	4 to 7
Subterranean Clover	5 to 9
Pastures (following cereals)	3 to 6
Lucerne (per cut)	4 to 7
Lucerne (during season)	20 to 30

SILOS.

A silo is a receptacle in which green forage can be stored so that it retains its succulence, without the whole mass decaying, and to fulfil these requirements such a receptacle must be fairly airtight, and so placed that water does not soak through the sides into the material stored. Naturally the more perfect the silo as regards being airtight and so also watertight, the better the final product, and the lower the percentage of waste.

Originally silos were simply holes dug in the ground, but these were improved upon by using masonry on bottom and sides, and later further improvement was made by building the silos wholly above ground. The latest development has been the manufacture of Silage without the help of a silo, by storing the forage in open stacks.

No matter whether the silo be an earth pit, or a pit lined with masonry, or an overhead silo constructed of masonry, wood, iron, composition, &c., there are certain essential features common to all. The bottom and sides should be impervious to air and water, otherwise much forage will be ruined, for when air is admitted moulds develop, and should water in quantity find its way into the silo, the material in the water rots down and looks like fully decomposed stable manure.

The sides of the silo should be perpendicular and as smooth as possible, and should contain no projections of any kind, so that in sinking the whole mass goes down regularly and evenly, for if this does not happen pockets of air are formed and the surplus air is not properly squeezed out of the mass, with much loss due to the growth of moulds.

The silo should have as few corners as possible, as corners make it difficult to pack the material tightly when filling, and they retard the sinking of the mass, so admitting air; the silo that fulfils this condition best of all is the circular silo.

The silo should be deep in proportion to its other dimensions; this, of course, means an increased weight on all below the immediate surface, and so a better expulsion and exclusion of air, less surface exposed to atmospheric agencies, and as silos are always emptied gradually, less surface exposed after each day's feeding is removed.

When the Silage is being removed for feeding to animals it is an everyday job, only sufficient being taken out of the receptacle each day for that day's feed requirements, and so it is of importance to see that when a silo is being constructed it be placed in close proximity to milking shed or other building where the animals are usually fed.

CAPACITY OF THE SILO.

In calculating the capacity of a silo it is usual to allow 50 cubic feet to the ton of Silage, and although this is somewhere nearly correct on the average, the variations due to height of silo, type of fodder, succulence of fodder, whether it be chaffed or whole, and the weight added, are really considerable. It is easy enough to make a fairly close estimate of the tons of Silage in a silo, by multiplying the surface area in feet by the depth of material in feet, and dividing the result by a figure between 45 and 55. This latter figure represents the space occupied by a ton of Silage, the lower figure being used if there is a mass of Silage 35ft. deep, and the greater figure for about 15ft. of Silage. It is more difficult to give a general figure for estimating the amount of Silage that can be put in a silo, because some receptacles can be heaped so far above the top that they are quite full of fodder after the mass has finished contracting, whereas others must be weighted down as soon as filled, and then the Silage shrinks a long way below the top. For silos with fixed roofs it can be taken that on the average one ton of Silage will be stored for every 70 cubic feet of air space in the silo, and for those with movable roofs or without roofs the figure will be somewhere between 45 and 60 cubic feet per ton of silage stored, according as the silo is filled or not.

In trench silos, which are always relatively shallow, and generally somewhere between 6ft. and 10ft. in depth, an allowance of about 60 to 65 cubic feet per ton is necessary. For instance, in a trench silo averaging 12ft. in width and 8ft. deep, every foot of length will hold about 1½ tons of Silage.

TABLE IV.—*Approximate Capacity of Various Cylindrical Silos.*

Inside diameter of Silo.	Depth of Silo.	Capacity of Silo.	Quantity when full of compressed Silage.	Usual quantity when Silo has fixed roof.
Feet.	Feet.	Cubic ft.	Tons.	Tons.
10	15	1,178	21	15
10	20	1,571	30	21
10	25	1,963	39	27
12	15	1,696	31	22
12	20	2,262	43	30
12	25	2,827	57	40
14	15	2,309	42	29
14	20	3,079	59	41
14	25	3,848	77	54
14	30	4,618	97	68
16	20	4,021	77	54
16	25	5,027	101	71
16	30	6,032	127	89
18	25	6,362	127	89
18	30	7,634	161	113
18	35	8,906	198	139

TABLE V.—*Approximate Capacity of Various Square Silos.*

Length of Sides.	Depth.	Capacity.	Quantity when full of compressed Silage.	Usual quantity when Silo has fixed roof.
Feet.	Feet.	Cubic ft.	Tons.	Tons.
8	10	640	11	8
8	15	960	17	12
8	20	1,280	24	17
10	15	1,500	27	19
10	20	2,000	38	27
10	25	2,500	50	35
12	15	2,160	39	27
12	20	2,880	55	38
12	25	3,600	72	50
14	15	2,940	53	37
14	20	3,920	75	52
14	25	4,900	98	69

TABLE VI.—*Approximate Capacity of Various Trench Silos.*

Width.		Length.*		Depth.	Quantity when Full of Compressed Silage.	Weight per Foot of Length (excluding Ends).
Top.	Bottom.	Top.	Bottom.			
Feet.	Feet.	Feet.	Feet.	Feet.	Tons.	Lbs.
10	8	40	10	6	21	1,861
10	8	50	20	6	30	1,861
10	8	60	30	6	38	1,861
10	8	40	10	8	29	2,580
10	8	50	20	8	41	2,580
10	8	60	30	8	52	2,580
10	7	50	10	10	44	3,173
10	7	60	20	10	58	3,173
10	7	70	30	10	72	3,173
12	10	40	10	6	26	2,274
12	10	50	20	6	36	2.274
12	10	60	30	6	46	2,274
12	10	40	10	8	36	3,154
12	10	50	20	8	50	3,154
12	10	60	30	8	64	3.154
12	9	50	10	10	54	3,920
12	9	60	20	10	72	3,920
12	9	70	30	10	89	3,920
14	12	40	10	6	30	2,688
14	12	50	20	6	42	2,688
14	2	60	30	6	54	2,688
14	12	40	10	8	42	3,727
14	12	50	20	8	59	3,727
14	12	60	30	8	75	3,727
14	11	50	10	10	64	4,667
14	11	60	20	10	85	4,667
14	11	70	30	10	106	4.667

* A long slope each end, so that conveyances can be driven into pit from either end.

CAPACITY OF SILOS FOR KNOWN REQUIREMENTS.

When a decision has been made to erect a silo, it becomes necessary to calculate the amount of Silage required, and to construct a silo of sufficient capacity to enable this quantity to be manufactured. If the Silage is to be used for milking cows, the number of cows to be fed must be multiplied by the amount to be given each animal daily, and the result multiplied by the number of days during which the cows are to receive Silage. If the tons of Silage required be multiplied by 50 cubic feet per ton of Silage, the approximate cubic capacity of the silo will be found, and by reference to Tables IV., V., and VI., dealing with *capacities of silos*, the measurements of a sufficiently large silo will be seen.

TABLE VII.—*Quantity of Silage and Capacity of Silo for Known Requirements.*

Cows to be fed.	Silage per head per day.	Feeding period.	Quantity of Silage.	Capacity of Silo.
No.	Lbs.	Days.	Tons.	Cubic ft.
15	30	100	20.1	1,005
15	40	100	26.8	1,340
15	50	100	33.5	1,675
15	30	125	25.1	1,255
15	40	125	33.5	1,675
15	50	125	41.9	2,095
15	30	150	30.1	1,505
15	40	150	40.2	2,010
15	50	150	50.2	2,510
20	30	100	26.8	1,340
20	40	100	35.7	1,785
20	50	100	44.6	2,230
20	30	125	33.5	1,675
20	40	125	44.6	2,230
20	50	125	55.8	2,740
20	30	150	40.2	2,010
20	40	150	53.6	2,680
20	50	150	67.0	3,350
30	30	100	40.2	2,010
30	40	100	53.6	2,680
30	50	100	67.0	3,350
30	30	125	50.2	2,510
30	40	125	67.0	3,350
30	50	125	83.7	4,185
30	30	150	60.3	3,015
30	40	150	80.4	4,020
30	50	150	100.4	5,020

OVERHEAD SILOS.

Despite the fact that silos built above ground are much more expensive than those made below the surface, they have so many advantages over all other types that *Overhead Silos* have almost completely superseded *Underground Silos* in all places where much Silage is manufactured. Their outstanding advantage is that the daily job of removing the material is very much simplified, whilst at the same time the filling of these silos is not much more difficult than that of underground receptacles, because the machinery made for the purpose is very efficient.

Overhead silos can be constructed of any material which can be made airtight, and which is strong enough to withstand the considerable pressure from the inside, but they are usually built of concrete or wood, although steel, and kinds of masonry other than concrete, are sometimes used.

REINFORCED CONCRETE SILOS.

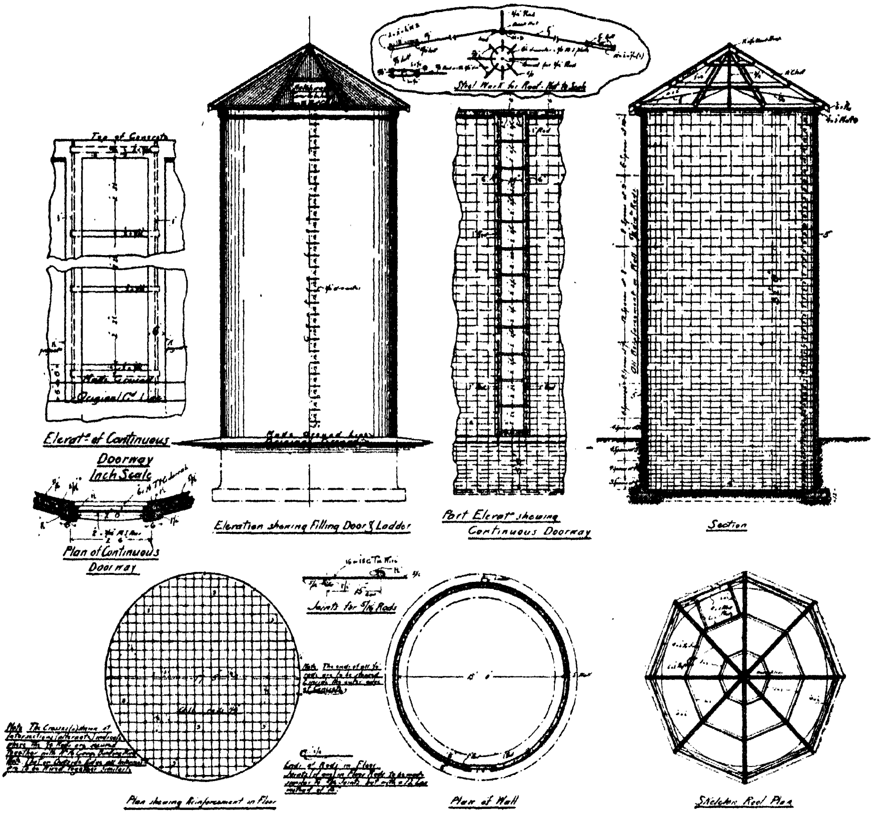
Reinforced concrete silos are the most permanent structures of all forms of silos, and although expensive are the most satisfactory from every point of view. A good deal of skill is required in building a cylindrical reinforced concrete silo, because specially constructed forms of wood or iron must be used, the reinforcing must be properly placed and fixed, the forms must be set perpendicularly each time they are shifted, a proper mixture of stone, sand, and cement must be used, each batch of the mixture must be brought to the same consistency, and be properly tamped so as to make a good solid wall, and a continuous doorway and shoot must be arranged for whilst building the silo. Extensive scaffolding is also necessary. The requirements are such that a skilled concrete man should always be employed when a reinforced-concrete silo is being erected.

The Materials Used.

As considerable strength is required in the relatively thin walls of a reinforced-concrete silo, it should be remembered that strong cement-concrete work is only produced when the best of materials are used.

Cement.—Only fresh cement of high quality should be used, and stocks held on hand should be stored in a dry place, and preferably on a wooden floor.

Sand.—Sharp sand binds together better than does rounded, water-worn sand, and so is to be preferred. The presence of clay, silt, or organic matter retards the proper setting of the cement, and so the sand should be free from these injurious substances.


Steel Work for Roof
Elevatⁿ of Continuous Doorway Inch Scale
Top of Concrete
Original Gᵈ Line
Plan of Continuous Doorway
Elevation showing Filling Door & Ladder
Part Elevatⁿ showing Continuous Doorway
Section
Joints for 5/16 Rods
16 – 18 G Tie Wire
Plan showing Reinforcement in Floor
Plan of Wall
Skeleton Roof Plan

Plan and details of a reinforced concrete silo 15ft. 6in. in diameter and 32ft. high. (Plan by J. Paull.)

Screenings.—The screenings, or crushed stone, should consist of regular-sized pieces, as odd large stones might interfere with the placing of the reinforcements. Really hard stone, such as quartzite, granite, or flinty limestone should be used.

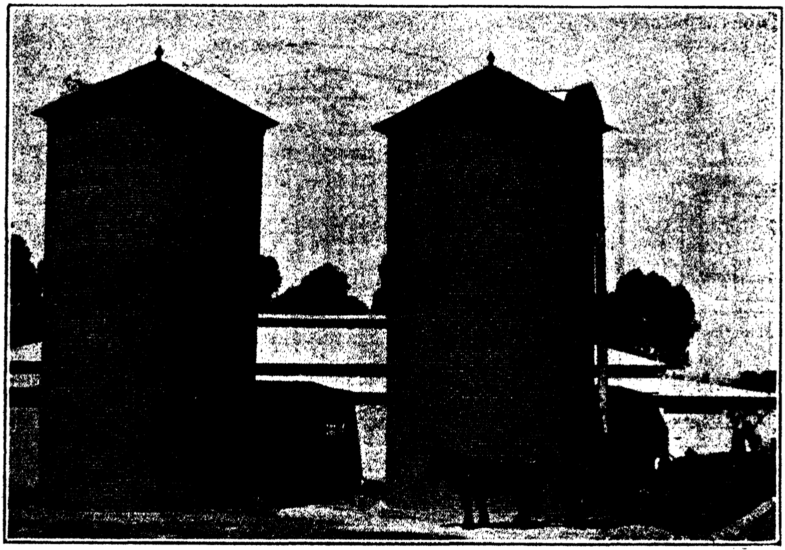
Water.—The water used should be clean and free from clay or organic matter in suspension, and should be reasonably free from an excess of saline matters, because some salts injuriously affect the lasting qualities of the cement concrete.

Reinforcing Material.—Because of its lack of strength, concrete work needs reinforcing, and for the purpose iron is one of the most suitable of materials to use. The iron to be used should be stout enough to be rigid and have no tendency to spring or stretch, and it must have surfaces rough enough to overcome the tendency to slip. If bright, smooth iron is used it is necessary to bend or twist it to secure the required grip.

The Mixture.

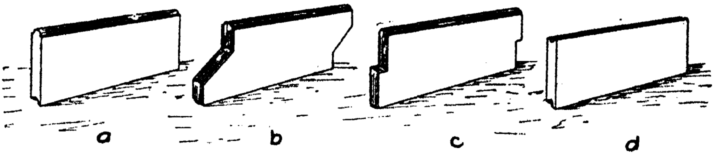
A good mixture for the cement concrete would consist of—

Two parts of ¾in. crushed hard stone.
Two parts of ⅛in. to ¼in. crushed hard stone.
Two parts of clean, sharp sand (not too fine).
One part cement.



A pair of Reinforced Concrete Silos at Roseworthy Agricultural College; showing the improved appearance following the use of corrugated iron on the outside forms.

The measured amount of crushed stone is spread in a ring on the mixing floor and made wet with water, and then the mixture of sand and cement, which had been previously mixed together in the dry state, is evenly distributed over it. The whole mass is now thoroughly mixed together whilst water from a watering can, or hose with a fine rose, is being applied in sufficient quantity to bring it to the right consistency. No more materials should be mixed at one time than can be used within a half-hour.



From "Silo Construction."

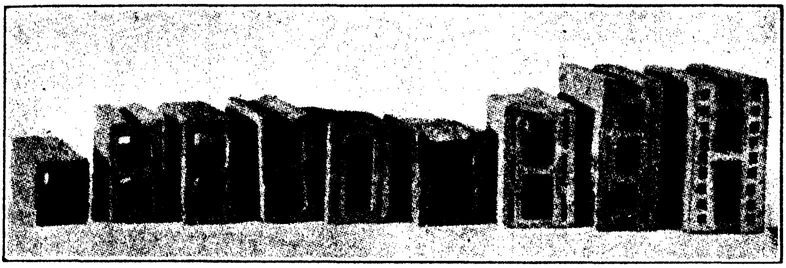
Reinforced concrete blocks for silo building; (a) book-shaped, (b) interlocking end joint, (c) stepped end, and (d) edges concave to be filled with cement mortar.

A much denser and smoother wall results if fairly moist concrete is put in the forms. Much less tamping is necessary with a mixture of such consistency, and the only disadvantage is that the forms must be left in position for a longer time than if a drier mixture is used.

The Reinforcements.

On really good ground the floor of the silo could be put down without reinforcements being used, but it is usually better not to take risks, and ¼in. rods crossed at right angles and tied together so that square meshes 9in. each way are made, are sufficiently strong for the purpose.

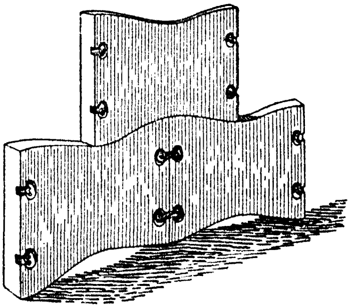
For a silo 15ft. in diameter and 30ft. in height, 5in. concrete walls are sufficient, and in such walls reinforcing rods of a diameter of 5/16in. can be used. The vertical rods which should always be tied on the inside of the horizontal rods, should be 12in. apart, whilst the horizontal rods will be spaced 4in. apart at the bottom with the spacing between rods gradually widening to 10in. at the top.



From "Silo Construction."

Hollow blocks made of burnt clay suitable for building walls of silos, provided plenty of bands are placed around walls to help withstand the inside pressure.

In a silo 25ft. in diameter and 40ft. high, the vertical rods should be of ⅜in. material spaced about 12in. apart. The bottom 9ft. to 10ft. of the walls will be reinforced with ½in. rods placed horizontally and spaced from 6in. apart at the bottom to 7½in., and from that height upwards ⅜in. rods are sufficient, the spacing between them gradually increasing from 4in. to 12in. at the top.



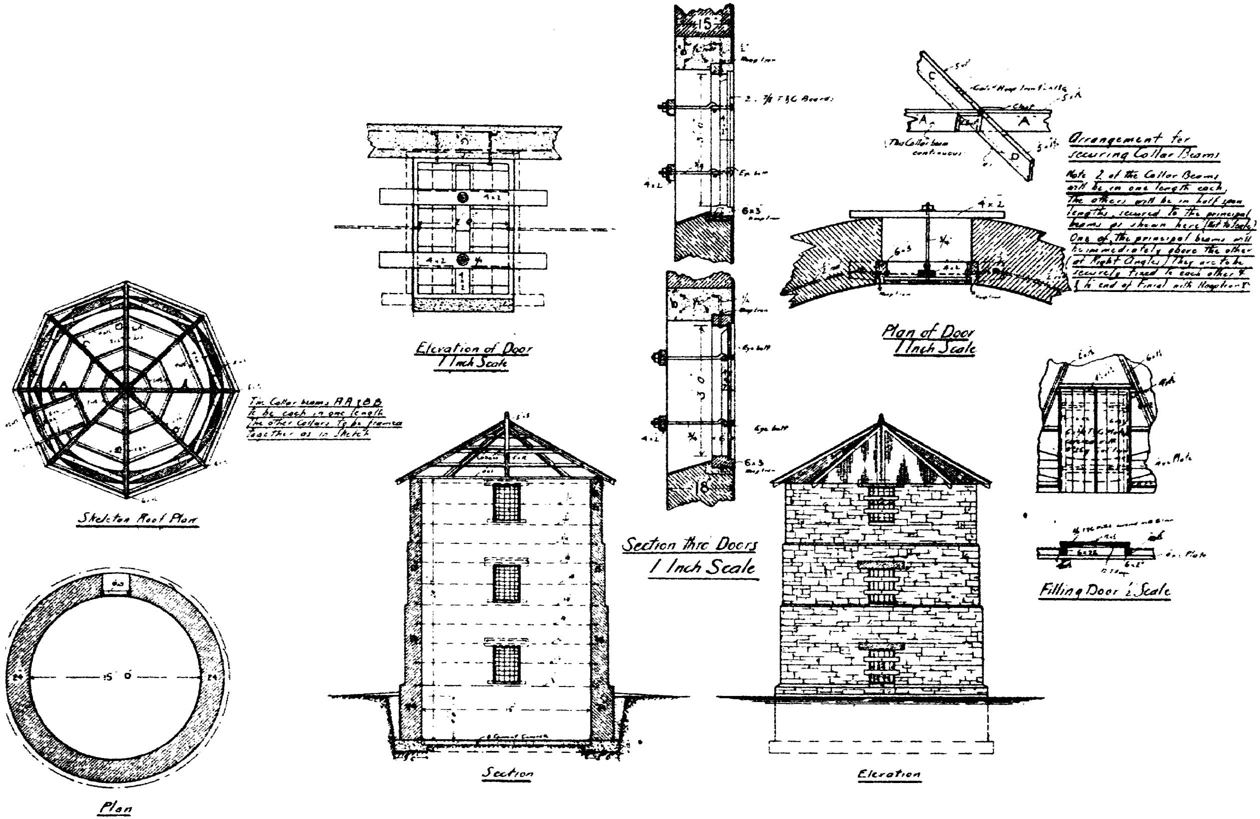
From "Silo Construction."

Shaped reinforced concrete blocks for silos, with ends of reinforcing steels exposed for coupling blocks together with clips.

All rods should be tied with No. 16 black tie-wire to all other rods that they touch. The vertical rods should be securely fixed to the reinforcements of the bottom. Wherever rods have to be joined they should have their ends turned over, and be overlapped a distance at least 40 times their diameter, and be securely bound together with tie wire; for instance, ⅜in. rods should be overlapped a distance of 15in.

Details of continuous doorway, roof, ladder, &c., are better seen in the accompanying plan of a cement-concrete silo.

C



Note 2 of the Collar Beams will be in one length each. The others will be in half span lengths, secured to the principal beams as shown here (Not to Scale.) One of the principal beams will be immediately above the other (at Right Angles.) They are to be securely fixed to each other & to end of Finial with Hoop Iron.

The Collar beams AA & BB to be each in one length. The other Collars to be framed together as in Sketch.

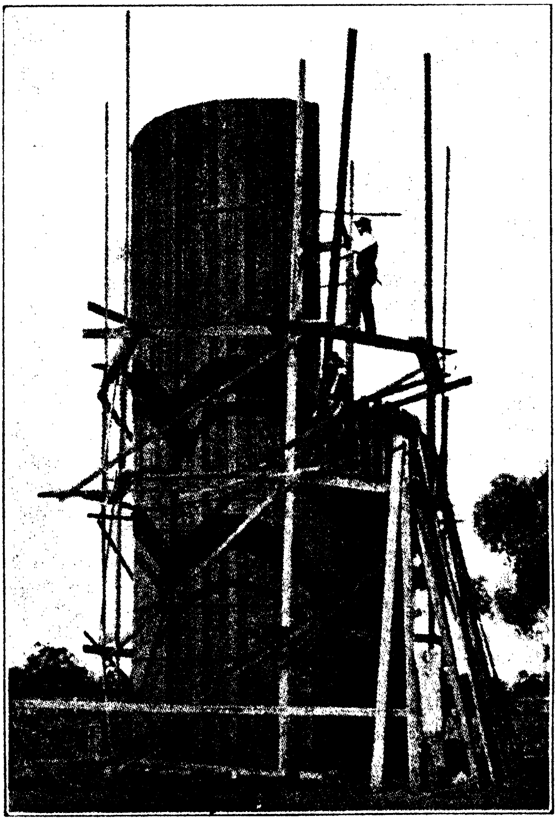
Plan and details of a masonry silo 15ft. in diameter and 24 ft. high. (Plan by J. Paull.)

STONE, BRICK, OR MASONRY BLOCK SILOS.

Overhead silos made of stone, bricks, or blocks are not quite so satisfactory as those made of concrete, but where it is more convenient to erect this form of masonry silo quite good results can be secured if care is shown when building. The chief difficulty with stone is to get the walls strong enough to withstand the inside pressure without having very thick walls. To get best results cylindrical silos should be built, and to keep down the amount of material used the walls should be stepped. Strength of walls will be maintained if iron hoops in the form of tightening bolts are placed around the silos in several positions. In a 25ft. silo the bottom quarter of the wall should be about 24in. thick, the next quarter about 18in. thick, the next about 15in., and the top quarter about 12in. If two hoops are put around each section, such a silo should prove quite satisfactory.

Burnt bricks and hollow tiles can be used in a similar manner to stone, and the same care is necessary to ensure sufficient strength in the walls.

Cement-concrete blocks of various patterns are used for making silos, and provided they are well strapped up with hoops which are never allowed to become excessively loose, they are well suited for the construction of this kind of receptacle, and are much lighter than ordinary masonry silos, because the walls are so much thinner.

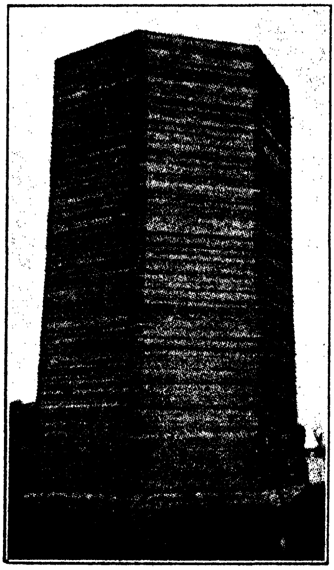


From Victorian Department of Agriculture Bulletin No. 45.

Erecting a wooden stave silo of 6in. by 1¾in. T and G timbers standing on end. The structure is kept together by ⅝in. bands, about 3ft. apart.

WOODEN SILOS.

In all places where timber is plentiful silos can be constructed of wood which prove quite suitable for the manufacture of silage, and are considerably cheaper than masonry silos. The great majority of wooden silos are what are known as stave silos, and are cylindrical in shape, and made with timbers from 4in. to 6in. in width placed vertically, and kept in position by hoops. The timbers are the full length of the silo where it is possible to secure such wood, but otherwise two lengths are used, being careful that the joints of adjoining pieces are not broken on the same horizontal line. When made of tongued and grooved staves of good quality timber, and when care is shown in keeping the hoops tight, such silos can be made to last 20 to 25 years. The hoops are of ½in. to ⅝in. rods, from 10ft. to 15ft. in length with long-threaded ends, and joined together with lugs against which the tightening nuts rest. The silos are almost invariably placed on a low masonry wall as a foundation, and when completed are anchored with guy ropes.



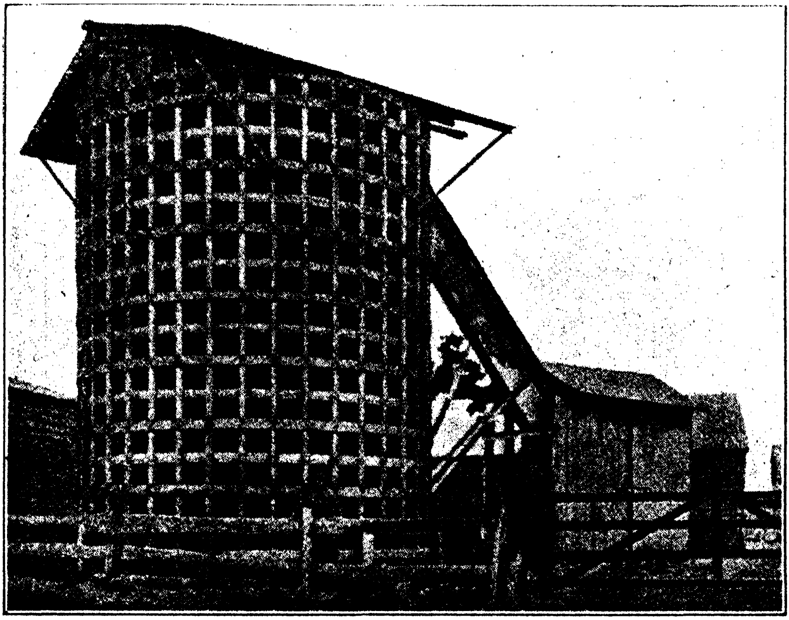
From "Silos and Silage in Colorado."
Easily constructed wooden silo where timber is plentiful. They are usually made of octagonal or hexagonal shape, and the inside is generally lined with some impervious material.

Home made wooden silos are easily constructed where timber is plentiful, and are made of octagonal or hexagonal shape, by placing the timbers horizontally. Material about 2in. by 4in. is used, and the pieces are cut to a shaped pattern, and the ends are halved before putting them in position. These silos are usually lined with such materials as weather boards placed vertically, cement plaster, or plain galvanized iron.

Wooden silos are never likely to be of importance in South Australia, because the lack of suitable timber means that they are very expensive, and the damage done to the wood by the severity of our Summer climate makes their upkeep much too costly.

WOOD AND IRON SILOS.

The acids developed in Silage attack iron fairly readily, and so it is not a really suitable material for the construction of silos, but it is easily handled for this type of structure, and if annually coated with a preservative like tar, pitch, or bitumen will last for many years. The easier way to make a silo in which iron plays an important part is to line a circular or sixteen-sided silo with 24-gauge galvanized iron on a wooden frame, the uprights and horizontals being spaced to suit the size of the sheets of iron being used. Such silos should be erected on a prepared masonry foundation.



From Victorian Department of Agriculture Bulletin No. 45.

A wood and iron silo constructed of 4in. by 2in. hardwood posts and 4in. by ¼in hoops fixed alternately on the inside and outside of the posts. The lining consists of plain galvanized iron of 24 gauge.

MASONRY PIT SILOS.

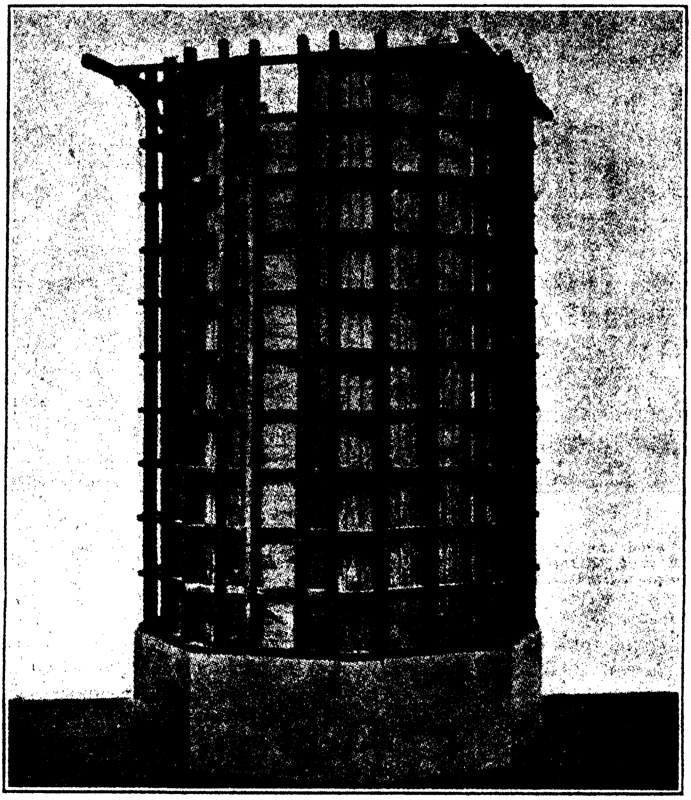
At one time pits lined with masonry were specially constructed for the making and storing of Silage, but now-a-days it is usual to erect an overhead silo when such a receptacle is required. Masonry pit silos are a great improvement on the earth pit, in that the bottom and sides are made air-tight and water-tight, and the smooth perpendicular sides facilitate the compacting of the mass of forage. The disadvantage of this form of silo, as against the overhead silo, is that the daily requirements of Silage must all be lifted out of the pit. This type of silo can be conveniently utilised when constructed in a steep hill or high bank, because a continuous doorway is made on the open side of the silo, which facilitates the emptying of the pit, and the filling is done readily by running the conveyances carrying the fodder to be ensiled on the top-side of the high land.

Any kind of masonry, such as cement concrete, stones, bricks, blocks, &c., can be used for the facing of pits, and where the walls are backed up by earth there is no need for great thickness, the principal need being just sufficient strength to prevent cracking.

TRENCH SILOS.

When it is desired to construct a silo and money is short, or when succulent feed is to be stored as an insurance against drought, there is no better way of doing it than in a trench silo. A first-class trench silo can be constructed with the ordinary tools and implements to be found on average farms, and if it be done during a slack period of the year it is almost wholly a question of labor, and calls for no actual outlay of money. As an insurance against drought, there are few better and more economical ways of storing fodder in times of plenty, and the silage made in trench silos keeps in really good condition for many years. At the Agricultural Society's Royal Show held in Adelaide in 1914, a very nice sample of Silage was exhibited which had been stored in an ordinary earth trench for over 20 years at Strathalbyn.

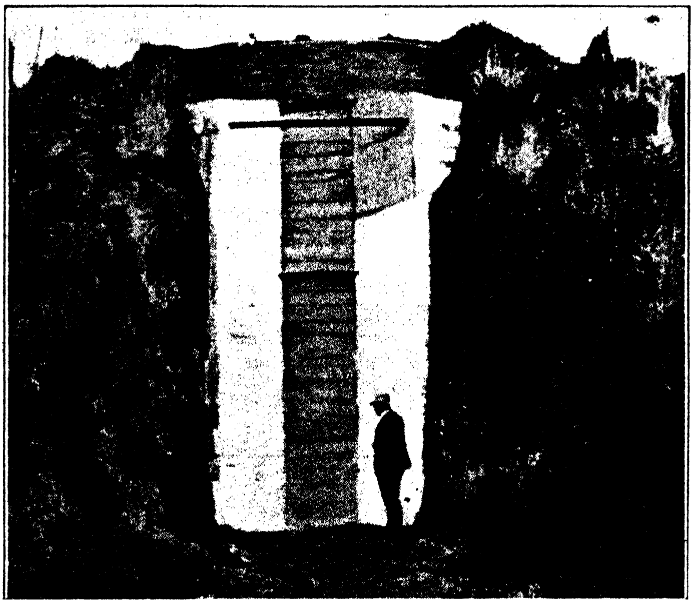
A trench varying from 10ft. to 14ft. in width at the top and from 6ft. to 10ft. in depth makes a suitable silo, if the texture of the soil and subsoil is sufficiently good for the walls to hold together when the trench is empty. The ends of the trench should have sufficient batter to allow the conveyances carrying the forage to enter the trench, and for the purpose the grade should be at least 2ft. to each 1ft. of depth. For instance, if the depth of the trench is 10ft., the top length of the trench should be at least 40ft. greater than the length of the bottom. The sides of the trench should have a slight batter, but if the soil is good enough to hold together in a trench 10ft. deep the bottom width should be only 3ft. less than top width, whilst in a shallower trench the difference in widths could be reduced to 2ft.



From "Silo Building and Ensilage Making."

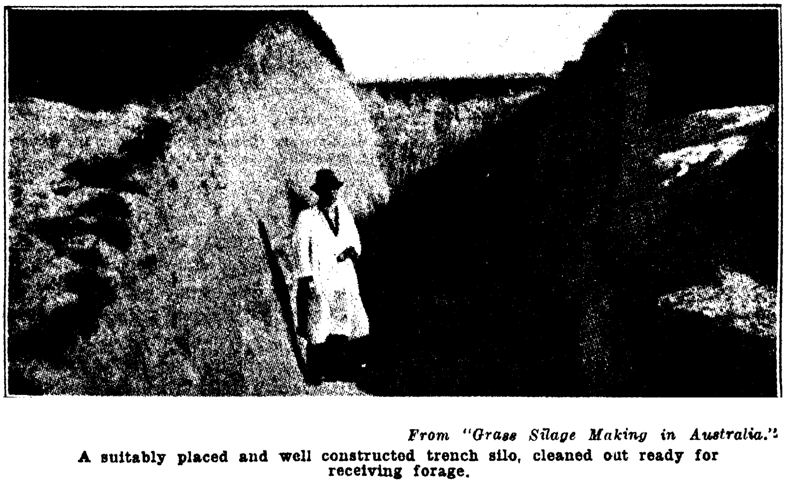
A wooden frame silo lined with weatherboards placed vertically. Such frames lined with sheet iron make fair silos, provided they are annually coated with tar, pitch, or such-like resistant substance. Sixteen-sided receptacles are better than those of octagonal shape.

The chief consideration when deciding on the site for a trench silo is the drainage, because it is essential that water does not enter the silo, either from the surface or underground. The best location for such a silo is on a ridge or hillock, where the surface water can readily be led away, and on such places the underground water-table is usually farther from the surface than on the flat ground.



From "Ensilage on the Farm."

Earth pit silos are somctimes the most suitable receptacles to make for the storage of Silage, and are convenient when made in a bank or hillock. The illustration shows a pit silo in an earth bank, with the open side concreted and a continuous doorway provided.

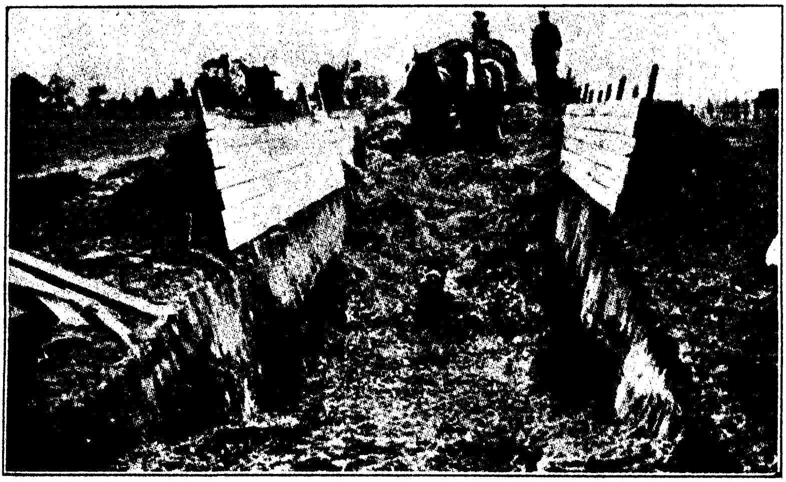


From "Grass Silage Making in Australia."

A suitably placed and well constructed trench silo, cleaned out ready for receiving forage.

The depth of the trench depends on the distance from the surface of the underground water-table, the type of soil and subsoil, and the purpose for which the Silage is being made. If the water-table permits, the trench can be extended to about 10ft., but it rarely pays to exceed this depth, because of the difficulty of sinking the trench, and the trouble of removing the Silage. Where the soil and subsoil hold together so that only a slight batter of the sides is necessary, the silo can be made of any convenient depth, but if there is a danger of the sides caving in the trench must of necessity be kept shallow. If the silo is to be filled and emptied annually, as is the case when used for dairy cows, it can be excavated to the full 10ft. in depth. If, however, the silage is to be used as an insurance against drought, and as such only required occasionally, it is usual to make trenches only about 6ft. or 7ft. deep.

Practically all of the work connected with the sinking of a trench silo can be done with a plough and scoop, but to facilitate the sinking of the Silage during manufacture, the sides should be finished off with a pick. Because the construction of a trench silo is largely a matter of labor rather than outgoing expenditure, it is looked upon as a "poor man's silo," but such silos are only warranted so long as drainage of underground water is not necessary, much time is not absorbed in sinking through rock or other obstructions, and the soil is not so sandy or gravelly that retaining walls are necessary, and if any of these disadvantages exist it is usually better to erect an overhead silo.



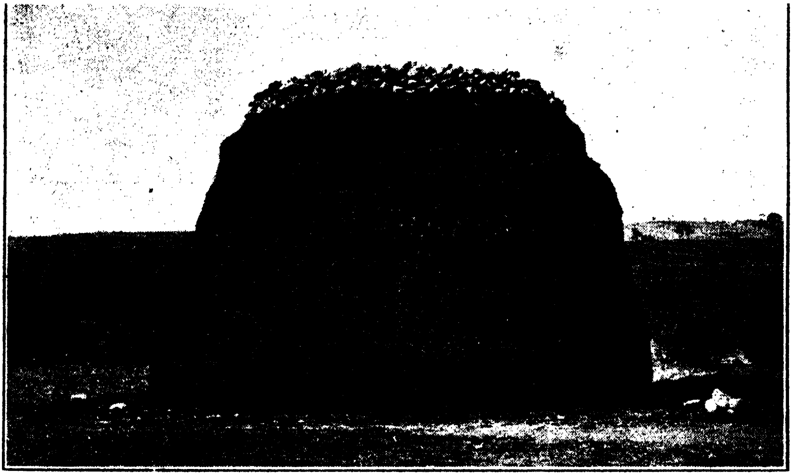
From "Grass Silage Making in Australia."

When filling a trench silo the conveyances carting the forage should help in consolidating the material by running over the material already lodged in the silo.

STACK SILAGE.

The simplest and cheapest method of making Silage is to dispense with the silo and make a stack of the succulent forage at a convenient spot near the farm buildings or out in the field where it was grown. The great advantage of this method of producing Silage is that it does away with the necessity of providing expensive receptacles to hold the forage, but it must be remembered that the losses of material during the process of manufacture are much greater under this system than where silos are utilised. The cured article from a stack properly constructed is just as good as from the best silo, provided the stack has not stood for too long a time. Stack Silage tends to dry out after a few years of exposure, particularly on the sides facing the direction of the prevailing winds, and so when it is intended to leave stacks of Silage for any length of time they should be built on sites where they will be protected from winds. In well built stacks properly protected from the wind, the Silage retains its succulence and feeding qualities for many years. The drying out of stack Silage does not render it useless, because it remains of fairly high feeding value, but the principal advantage of Silage, viz., its succulence, is lost.

Although the losses of material are fairly considerable with stack Silage, it can be confidently expected that where reasonable care is shown when building the stack, first class Silage weighing 70 per cent. of the weight of the green forage put into the stack will be secured. Besides this, nearly all of the apparently spoilt material on the sides and top will be readily consumed by "dry" cattle and sheep, so the actual waste is not so enormous.



A circular stack of Lucerne Silage at Wood's Point, showing the bottle shape assumed on settling, due to keeping the outside edge much higher than the centre during building operations. Under this system of stack building no difficulty is experienced in keeping the weights in position, and the outside is so consolidated that the waste is considerably reduced.

One of the principal advantages of making Silage in stacks is that the forage is stored whole, and if cut with a binder the sheaves are stacked without cutting the bands, and so its manufacture is mainly a matter of labor, and does not demand expensive machinery.

The removal of the Silage from stacks is also a simple matter, as the material is readily chopped out with a squaring axe, and is always friable enough to be easily handled.

THE MAKING OF STACK SILAGE.

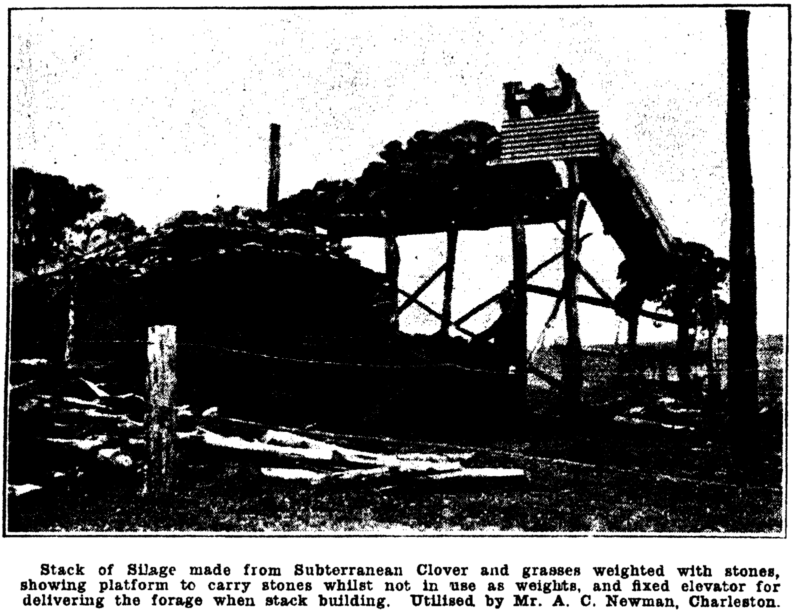
The stack can be erected near the farm buildings, or as is more often the case, in the field where the crop of forage to be ensiled was grown. In selecting the site for the stack it is necessary to avoid hollows likely to fill with water, and if it is possible to choose a spot where the stack will be protected from the prevailing winds so much the better.

The forage can be placed directly on the surface of the ground in most places, but there is sometimes a saving of waste of good forage if straw or such-like material is spread on the soil, before the first load of forage is distributed. On no account should materials be placed under the stack which will admit of the circulation of air, such as posts, wooden dunnage, stones, &c., because by so doing the loss of forage is considerably increased.

When deciding on the size of the base of the stack it is first necessary to estimate the amount of material to be stored as Silage, and to make quite certain that the base is not too large for the quantity available. Where there is not sufficient height of material in a Silage stack the loss is increased out of all proportion to the quantity of material. Whatever the diameter of the stack the aim should be to finish with a stack from 6ft. to 8ft. high, after it has completely settled. To get somewhere near this desired height the following allowances should be made:—

TABLE VIII.—*Size of Base of Silage Stack.*

Green Forage.	Silage.	Diameter of Stack.
Tons.	Tons. (Approximate.)	Feet. (Approximate.)
30	21	10
45	31	11
60	42	12
75	52	14
90	63	15
120	84	18
150	105	20

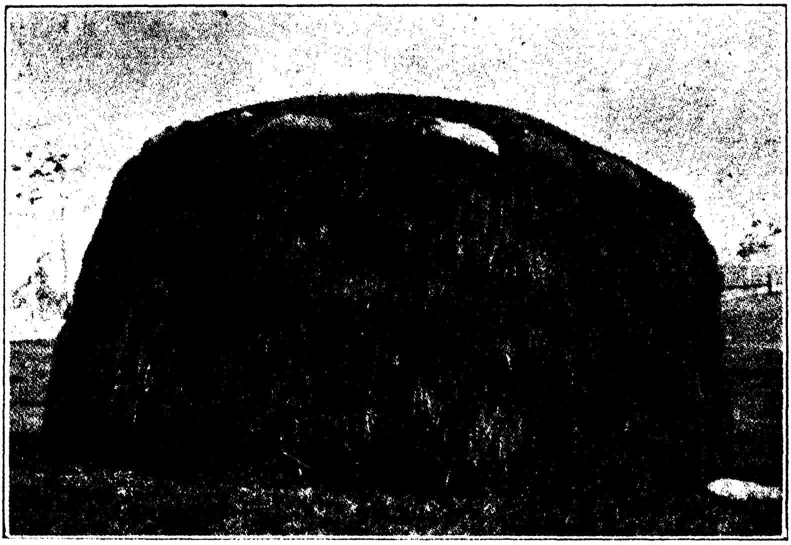


Stack of Silage made from Subterranean Clover and grasses weighted with stones, showing platform to carry stones whilst not in use as weights, and fixed elevator for delivering the forage when stack building. Utilised by Mr. A. C. Newman, Charleston.

Circular stacks are the most suitable where relatively small quantities of Silage are to be made, because they are much easier to build, and the losses are proportionately less than from rectangular stacks. Rectangular stacks are more suited for the storage of large quantities of forage, for when opened on one end there is less liability to the development of moulds and decay whilst using the Silage, than if a wedge-shaped piece is cut out of a large circular stack.

When building the stack it is usual to cart enough material on the first day to make the stack from 6ft. to 8ft. high, and then to place more fodder on the stack each day, arranging the carting so that it takes from 6 to 12 days to complete the stack. In practice it is found that if the temperature of the stack keeps rising, and the stack itself keeps sinking, it is essential to put more material on each day, or else to weight down the stack until again ready to start cutting and carting. Experienced Silage-makers can tell by plunging the hand into the material whether it is hot enough to require more fodder, but for beginners it is better to keep a thermometer in a piece of ordinary gas-piping let into the Silage. If the temperature rises above 120°F. more fodder or weights should be added, and this must be done before the temperature reaches 130°F. As a general rule it will be found that if from 3ft. to 6ft. of forage is added to the stack every day, a first class Silage will be made, but it should be remembered that immature, sappy forage heats up much slower than does more mature and drier forage, and that in cool weather less material is put on daily than in warm weather.

If the forage to be used is not all at the same stage of maturity, the drier, more mature portions should be cut first and put on the bottom of the stack, and the immature, sappy portions be left for the top of the stack. If handled in this way the drier stuff will be improved by the extra pressure and the soaking into it of the juices of the top layers.



From "Livestock Bulletin," 1/6/31.

When more suitable material is not available, bags of soil placed around the edges of a Silage stack are effective in keeping soil used for weighting purposes in position.

Throughout the building of loose material into a stack, the centre should be kept much lower than the outside, and at completion the top should be finished off with the centre only slightly above the outside edges. After the weight has been put on a stack built in this way, the centre sinks down more than the outside, leaving the top practically level, and cylindrical stacks assume a bottle shape, and have much less waste around the outside than where the centre has been kept high during building operations.

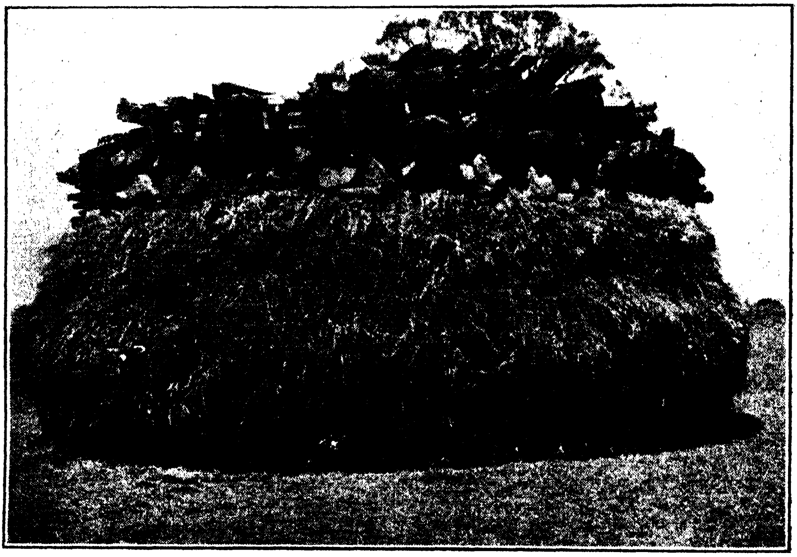
Frequently, during stacking operations, the outside of the stack should be strongly raked down with a fork, which reduces the openness, allows of the better shedding of water, and lowers the loss through over-decomposition.

When stacking coarse-textured forages like Maize, Sorghum, &c., which are liable to slip when the stack is settling down, it is of advantage to make rectangular stacks, and to erect a series of poles 3ft. or 4ft. apart along the line of the two long sides, and couple the tops of the opposite ones together in some way. If the forage is laid lengthways in the stack there will be no slipping of the material. To reduce loss on the ends of the stack the forage should be trimmed nice and square, during building operations.

As soon as a stack is completed it should be weighted down.

If weights are used that can be easily handled, they can be moved from place to place on the top of the stack if uneven settling is taking place, and in this way any tendency to fall over, or to bulge out in places can be overcome, with advantage to the appearance of the stack and the quality of the Silage.

Silage stacks should not be opened for 6 weeks or so after completion, and less mould develops on the cut faces if the stacks are kept closed for 10 to 12 weeks, when most of the fermentation processes will have ceased.



A circular stack of cereal Silage weighted down with fencing posts.

Most Silage stacks are too large to be able to take a layer off the whole of the stack every day for feeding to the livestock, and so it becomes necessary, in nearly all cases, to open one end of the stack and cut the Silage away to a vertical face. The smaller the area of this exposed face, and the shorter the period of time it is exposed the less waste there will be, and so it is essential for best results to take so thin a slice off the face that it will not be more than 3 or 4 days before the next slice is started. To cut a slice of Silage from the end of a stack there is no more efficient tool than a squaring axe, for it does the job rapidly, cleanly, and without strain on the operator.

ADDITION OF MINERALS WHEN MAKING SILAGE.

It is sometimes recommended to add Common Salt to the green forage as it is being put into the silo or stack, but this is likely to prove such a disadvantage that any good the animals might receive from the presence of the salt will be counteracted by the poorer quality of the Silage. Salt is usually added to forage to increase its palatability, but as properly made Silage is more palatable to farm livestock than any other foodstuff supplied to them, improvement in this direction cannot be looked for by the addition of salt. Further, successful Silage-making depends almost wholly on ferment and bacterial action, and as Common Salt retards these activities, poorer quality Silage is probably manufactured when this substance is added. The control of bacterial action by Salt is so great, that in wet countries where extreme difficulty is experienced in making hay, the partially dried material is stacked, liberally sprinkled with Common Salt, and cures into a brown hay, whereas without the salt it would have rotted down, or developed so much heat as to have fired.

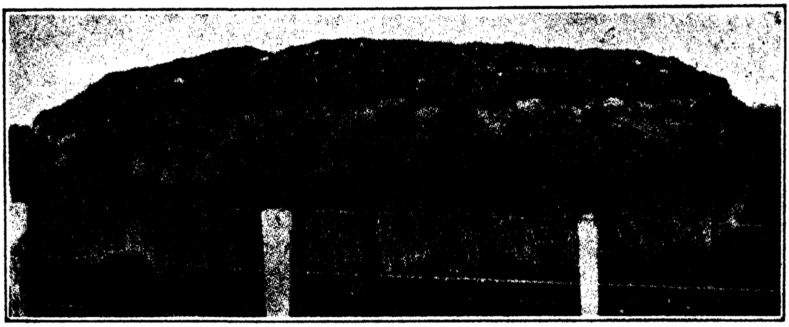
From "New Zealand Farmer," 1/10/31.

A well made stack of Silage, effectively weighted with soil, kept in position by heavy timbers.

From "Ensilage on the Farm."

Poles used to keep the earth in position when placed on a Silage stack to weight down the material.

Practically none of the ordinary foodstuffs contain sufficient minerals for the requirements of cows giving a good yield of milk, and this applies more particularly to lime and phosphorus. Some of this shortage can be made up by adding these minerals to the Silage whilst being put in silo or stack, and the presence of both lime and phosphorus encourages bacterial activities to such an extent that a much improved Silage should result. When Silage is being manufactured for the use of dairy cows, the sprinkling amongst the forage, during silo filling or stack building, of from 28lbs. to 56lbs. of finely ground Raw Rock Phosphate per ton of forage being stored, will improve the quality of the Silage, and considerably enhance its feeding value.



From "Ensilage on the Farm."

A strip of wire netting run round the eaves of a Silage stack makes a good barrier to hold soil in position when used as a weight to consolidate the forage.

UTILISATION OF SILAGE.

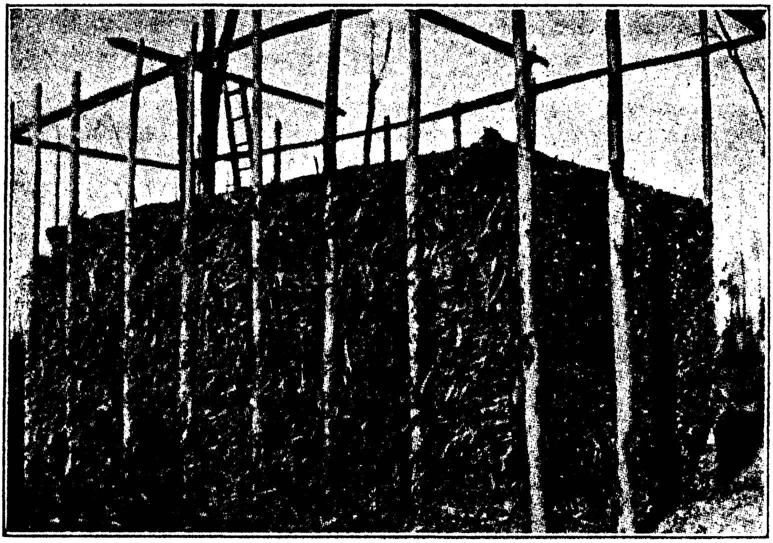
When considering the uses and value of most of the well-known feeding stuffs it is usual to study the composition of the fodders and then their digestibility, and on the figures disclosed calculations are made as to the economic value of the various materials, how much to give to the animals, and what kinds and proportions of fodders should be mixed together. This also applies to some extent when Silage is to be used, but Silage possesses so many other qualities which are not disclosed by chemical analysis or digestibility experiments that it is almost in a class by itself. The ordinary grazing farm livestock produce milk and meat to best advantage, and keep in better health, when allowed to get most of their food by grazing on good pastures, and Silage is the only foodstuff which gives results anywhere nearly approaching pastures. As a matter of fact good Silage,

From "Ensilage on the Farm."

This flat Silage stack is the result of building upon a base which was much too large for the available forage. The loss of Silage is considerably greater than if a reasonably-sized base had been arranged for.

when fed to milking cows and ewes with lambs, gives even better results than succulent green forage if the latter is cut and carted to the animals, particularly where the coarse-textured green forages are concerned.

The palatability of Silage is very high, and animals prefer it to all other ordinary foodstuffs, and perhaps of equal importance is the fact that it keeps up the appetite of animals receiving it, and so they consume more. All rations are improved by the addition of Silage, because all of the other constituents of the ration have their palatability increased, due to the presence of the Silage.



From "Australian Dairyman's Handbook."

Forage stacked as Silage between two lines of poles. Supported in this manner, coarse-stemmed plants, like maize, sorghum, &c., which are very liable to slip in ordinary stacks, can be stacked with perfect safety.

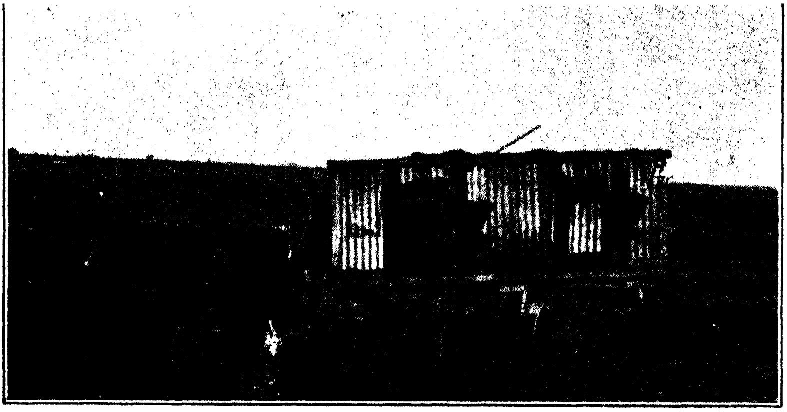
Silage is a wonderful foodstuff to keep animals in good health. It is always sufficiently laxative to maintain the digestive organs in good condition. If fed in the morning before animals are turned out to graze it prevents bloat to a very great extent. Cows and ewes have less trouble in giving birth to young if fed on Silage for a few weeks beforehand. Even in the driest times impaction is prevented when Silage is fed to the animals, and it is largely because of this that Silage has such great value in saving sheep and cattle in times of drought. There is no other bulky foodstuff to equal Silage in loosening the skin of animals, and in putting "bloom" on them. In all places where bone-chewing is a common practice with cattle, it ceases as soon as Silage is used as a part of the ration.

The amount of water taken in by animals in milk plays a big part in the quantity of milk secreted, and the feeding of Silage during the winter, when it is difficult to get animals to drink sufficient cold water, adds considerably to the amount of water consumed.

Although Silage can often be used to advantage by all farm livestock, because of its peculiar characteristics, it is more suitable for utilisation by dairy cows, ewes in stud flocks, and sheep and cattle in times of drought.

REMOVAL OF THE SILAGE.

When fodder has been placed in a silo it can be fed to livestock any time after the completion of filling the receptacle, but it is better to wait until the principal fermentative activities have subsided. In most silos the chief fermentations will be over a few days after weighting down the Silage, but although less active they still continue working for two or three weeks, and so for best results silos should not be opened for the removal of the Silage until the material has been in them for about four weeks, although it can be done much sooner if the fodder is urgently required. In the case of stacks of Silage it is better to leave them for 10 to 12 weeks before commencing to use the fodder, as there is then less tendency for Silage stored in this manner to go mouldy after being exposed to the atmosphere.



A useful lorry, with galvanized iron frame, used at Wood's Point for carting Silage to feeders in the fields. The doors, which are hinged at the bottom, drop on to the edge of the feeder, and act as shoots for guiding the Silage into the trough.

Although Silage will keep almost indefinitely in a silo, and for some years in a properly constructed and protected stack, the material rapidly deteriorates on being exposed to the air, and in warm weather becomes useless very quickly. Because of this, success with the making and using of Silage is closely connected with the careful removal of the fodder from the silo. When ready to use the material stored in a silo, the weights and any covering used are removed from the whole surface of the Silage, and the few inches of decayed fodder is taken to a place where the farm stock will not have access to it. A shallow layer of Silage is now scraped off the whole surface of the silo, and on no account should a hole ever be dug into the material itself.

Sufficient Silage is scraped off the whole surface each day to be used on the day it is removed, and in securing it care is taken not to loosen up any more material than is to be removed. In warm weather, when moulds develop rapidly on exposed Silage, 2in. to 3in. of material should be removed daily, but in cool weather 1in. each day is sufficient to make certain that it is always good, sound Silage which is fed to the animals. Silage keeps cooler in pits than in overhead silos, and so a shallower layer can be removed without damage to the Silage, and in most cases a 1in. layer daily is sufficient, even in warm weather. A few farmers go so far as to keep a waterproof sheet in the silo to cover the surface as soon as the day's supply of Silage has been removed, but this is hardly necessary with fully matured Silage from which a layer is being taken daily.

In preparing to remove the Silage from a trench silo, the soil used as a covering and weight should be cleanly removed from one end with a scoop, and the decayed portion down to the good fodder, which is usually about 3in. to 4in. deep, is cleaned off with a shovel. The material in the end of the trench should be cut out so as to leave a vertical face right across the trench. If it was practicable, the daily supply should be taken by cutting a layer from off the whole of the exposed end of the Silage, like cutting a slice of bread from a loaf, but this does not prove a reasonable proceeding unless very large quantities of Silage are to be used every day. Provided the time taken to complete the removal of the slice right across the exposed surface of the Silage is not too long, no great development of mould takes place, and it is usual to start a fresh slice about once a week. In very hot weather the period must be shortened, to keep down loss of material, and the risk of affecting the health of livestock, but, on the other hand, in really cool weather less haste is necessary. The squaring axe is a first-class implement for cutting off the slice of Silage, and once the cut has been made the material is easily picked up with forks for loading into bags or boxes, to be pulled to the surface by windlass or pulley and blocks.

Where small stacks of Silage have been built, or where large quantities of fodder are used daily, the whole of the stack is opened and a layer is scraped from the full surface each day. This rarely happens, however, and the Silage is removed in much the same manner as it is from a trench silo. The end of the stack farthest from the prevailing winds is opened, and a slice is cut off the whole of the exposed face. As stack Silage develops moulds much more rapidly after exposure than is the case in silos, the layer removed should be of such thickness that a fresh slice will be started every three or four days.

FEEDING VALUE OF SILAGE.

Although it is impossible to show in figures some of the advantages possessed by Silage as a feeding stuff for farm livestock, the actual feeding value as regards the production of milk, energy, muscle, fat, &c., can be seen in the chemical composition and digestibility figures presented in the next table, for several different kinds of Silage, with a few samples of green forages for comparison purposes.

Table IX.—*Feeding Value of Some Australian Silages.*

Silage.	Composition.						Digestible Nutrients.				Starch Equivalent.	Nutrient Ratio.
	Water.	Ash.	Crude Protein.	Crude Fat.	Nitrogen Free Extracts.	Crude Fibre.	Crude Protein.	Fat.	Nitrogen Free Extracts.	Fibre.		
	%	%	%	%	%	%	%	%	%	%	%	
Masonry Silos—												
1. Sorghum	75·0	2·3	2·3	0·5	13·7	6·2	1·2	0·2	9·4	3·5	12·3	1 to 11·1
2. Lucerne	75·0	2·3	3·9	1·1	10·1	7·6	2·6	0·6	6·9	3·2	10·9	1 to 4·4
3. Barley and Peas	75·0	2·2	2·8	0·7	11·9	7·4	1·8	0·4	7·4	3·7	10·8	1 to 6·7
4. Barley and Peas	75·0	2·5	3·0	1·2	10·4	7·9	1·9	0·6	6·4	4·0	10·3	1 to 6·2
5. Sunflowers	75·0	4·6	1·2	0·5	10·8	7·9	0·7	0·3	8·1	3·2	9·5	1 to 17·1
6. Barley	75·0	3·3	2·0	0·4	9·9	9·4	1·2	0·2	5·5	5·6	8·7	1 to 9·6
Trench Silos—												
7. Maize	75·0	1·2	1·5	0·6	13·5	8·2	0·9	0·3	9·3	4·5	12·1	1 to 16·1
8. Wheat	75·0	2·1	1·8	0·8	13·0	7·3	1·1	0·4	7·3	4·4	10·9	1 to 11·4
9. Barley	75·0	2·6	2·2	0·8	10·7	8·7	1·3	0·4	6·0	5·2	9·8	1 to 9·3
Stacks—												
10. Sub. Clover and Rye Grass	75·0	2·5	4·8	1·0	11·1	5·6	3·1	0·5	7·9	3·1	13·0	1 to 3·9
11. Burr Clover and Wild Oats	75·0	2·1	2·9	0·7	12·7	6·6	1·9	0·4	9·0	3·6	12·8	1 to 7·1
12. Sub. Clover and Grasses	75·0	2·7	3·0	0·7	11·1	7·5	1·9	0·4	7·9	4·1	11·8	1 to 6·8
13. Sub. Clover and Grasses	75·0	2·4	3·6	1·0	10·1	7·9	2·3	0·5	7·2	4·3	11·6	1 to 5·5
14. Sub. Clover and Grasses	75·0	2·5	4·0	1·1	9·1	8·3	2·6	0·6	6·4	4·6	11·4	1 to 4·7
15. Wheat	75·0	1·7	3·1	0·8	12·6	6·8	1·9	0·4	7·1	4·1	11·3	1 to 6·4
16. Oats	75·0	1·9	3·1	0·6	12·9	6·5	1·9	0·3	7·2	3·9	11·2	1 to 6·2
17. Wheat	75·0	1·9	3·5	0·9	10·9	7·8	2·1	0·4	6·1	4·7	10·6	1 to 5·6
18. Wheat	75·0	2·4	2·8	0·7	10·8	8·3	1·7	0·4	6·0	5·0	10·2	1 to 7·0
19. Burr Clover, Wild Oats, and Cape Weed	75·0	2·4	2·2	0·7	11·3	8·4	1·3	0·4	6·3	5·0	10·0	1 to 9·4
20. Paspalum	75·0	2·8	2·7	0·9	10·9	7·7	1·7	0·4	6·5	3·8	9·8	1 to 7·8
21. Sub. Clover and Grasses	75·0	3·0	2·6	0·9	10·1	8·4	1·7	0·5	6·5	3·8	9·6	1 to 7·9
Stack, 10 Years Old—												
22. Maize	75·0	0·3	2·3	0·8	15·1	6·5	1·2	0·4	10·4	3·6	13·6	1 to 12·4
Green Forage—												
Barley	75·0	1·6	1·7	0·4	13·4	7·9	1·2	0·2	9·6	5·1	13·2	1 to 12·6
Maize	75·0	1·6	2·2	0·6	13·4	7·2	1·3	0·4	8·6	4·0	12·0	1 to 10·4
Rye Grass	75·0	2·6	2·9	0·7	11·6	7·2	1·8	0·3	7·5	4·0	11·2	1 to 6·8
Oats	75·0	1·9	2·1	0·6	11·2	9·2	1·5	0·4	7·0	5·3	10·6	1 to 8·8
Lucerne	75·0	2·3	4·1	0·8	9·7	8·1	2·8	0·4	5·9	3·6	9·8	1 to 3·7

NOTES ON SAMPLES IN TABLE IX., WHICH GIVES "FEEDING VALUE OF SOME AUSTRALIAN SILAGES."

No. 1.—*Sorghum:* Silage made in a masonry pit at Roseworthy Agricultural College in 1914, a period of 4½ months elapsing between filling silo and using the fodder. Well weighted with fencing posts.

No. 2.—*Lucerne:* Made from chaffed Lucerne in December, 1930, in an overhead masonry silo at Wood's Point, the sample being taken at the end of May, 1931. Well weighted with stones.

No. 3.—*Barley and Peas:* Made by Mr. E. L. Miller, of Gawler, in a pit with cemented walls, from Six-rowed Barley and Field Peas grown in 1931, the grain of the former being in the doughy stage, and the pods of the peas well developed. Sample taken April 4th, 1932. No weights used.

No. 4.—*Barley and Peas:* Made by Mr. W. J. Dawkins, of Gawler River, in an overhead cement-concrete silo from Six-rowed Barley and Field Peas grown in 1931, the former having just headed and the Peas just forming pods. Sample taken April 4th, 1932. No weights used.

No. 5.—*Sunflowers:* Silage made in masonry pit at Roseworthy Agricultural College in 1921, the chaffed Sunflowers being put on top of Barley silage already in the pit. Well weighted with fencing posts.

No. 6.—*Barley:* Silage made in Masonry pit at Roseworthy Agricultural College in 1920 from Six-rowed Barley. Well weighted with fencing posts.

No. 7.—*Maize:* Hickory King Maize from a crop going 20 tons per acre put into silo in autumn, 1931, at Nowra, New South Wales, and sample taken in September, 1931. Quoted by Mr. J. N. Whittet in *Agricultural Gazette of New South Wales*, Vol. XLIII., Part 3.

No. 8.—*Wheat:* The crop was cut in 1931 by binder, in the flowering stage, by Mr. A. Sparrow, of Sandy Creek, and made into silage in a trench 6ft. deep, by stacking in sheaves, running over the material with every load, and covering with soil. Sample taken on January 6th, 1932.

No. 9.—*Barley:* Made by Mr. A. Sparrow, of Sandy Creek, in 1931, by stacking sheaves of Six-rowed Barley in a trench 6ft. deep, running over the material with every load, and covering with soil. Sample taken February 27th, 1932.

No. 10.—*Subterranean Clover and Rye Grass:* Made in a stack in 1931 by Mr. R. J. Trott, of Meadows, the pasturage consisting in the main of Subterranean Clover and Perennial and Wimmera Rye grasses, but there was also some Soft Brome and Silver grasses and Clustered Clover. Sample taken January 21st, 1932. Weighted with strainer posts piled to a depth of 4ft.

No. 11.—*Burr Clover and Wild Oats:* Besides Burr Clover and Wild Oats there was an appreciable amount of Wild Mustard in the pasturage used by Mr. J. Sincock, of Concordia, to make this silage. The material was rather over-mature when cut, and, although sprinkled with water during stacking, and fairly well weighted, the outside of the stack dried like hay, whilst the centre was charred. Put down in the Spring of 1931, and sample taken January 6th, 1932.

No. 12.—*Subterranean Clover and Grasses:* Made by Mr. T. Smee, of Charleston, in November, 1930, from pasturage containing about 20 per cent. Subterranean Clover, the remainder being mainly Sea Barley and Sterile Brome, but there were appreciable quantities of Yorkshire Fog, Soft Brome, and Silver Grasses. Too mature and too dry when put in stack, and although stones were used as weights, they were far from sufficient to properly compact the material together. Sample taken May 18th, 1931.

No. 13.—*Subterranean Clover and Grasses:* The pasturage used by Mr. A. C. Newman, of Charleston, to make this silage in November, 1930, contained about 30 per cent. Subterranean Clover, the remainder consisting of Sterile Brome, Soft Brome, and Silver Grasses, and some Spear Thistles. These very spiny thistles, often known as Scotch Thistle, are readily eaten by cattle when converted into silage. The crop was a little on the dry side, and although weighted with stones, more weight could have been used with advantage. Sample taken May 18th, 1931.

No. 14.—*Subterranean Clover and Grasses:* About 75 per cent. of this pasturage, grown by Mr. S. H. Andrew, of Charleston, consisted of Subterranean Clover, the remainder being made up of Sterile Brome and Soft Brome, with some Perennial Rye grass and Rib grass. Crop green and succulent when stacked in early November, 1930, and fairly well weighted. Covered with straw before stones were put on to weight it down. Very little waste at top or sides. Built in eight days. Sample taken May 18th, 1931, from near bottom of stack.

No. 15.—*Wheat:* Made by Mrs. E. Hartmann, of Monarto South, by stacking sheaves of wheat cut at the flowering stage in October, 1931. Sample taken February 19th, 1932. Fairly well weighted.

No. 16.—*Oats:* A round stack was built by Mr. C. S. Nankivell, of Mudla Wirra, of sheaves of Oats and a little Six-rowed Barley, cut in the milky stage, in the Spring of 1931. Sample taken January 6th, 1932. Fairly well weighted.

No. 17.—*Wheat:* Made by Messrs. Thomas Bros., of Monarto South, in October, 1931, by stacking sheaves of wheat cut in flowering stage, and sprinkling the material with water whilst being put together. Sample taken February 19th, 1932. Well weighted with stones.

No. 18.—*Wheat:* Made by the Farm Manager of Northfield Mental Home in the Spring of 1931, by stacking sheaves of wheat cut in flowering stage. Sample taken January 6th, 1932. Fairly well weighted.

No. 19.—*Burr Clover, Wild Oats, and Cape Weed:* The pasturage was made into silage by Mr. J. H. Dawkins, of Gawler River, by cutting it with a binder without elevator canvasses, and stacking the loose stuff. Put in stack in the Spring of 1931, and sample taken February 27th, 1932. Fairly well weighted.

No. 20.—*Paspalum dilatatum:* Made at Nowra, New South Wales, in the Autumn of 1931 from grass that had made rapid and luxuriant growth, with the seed head just formed, but not reached the flowering stage. Sample taken September, 1931. Quoted by Mr. J. N. Whittet in *Agricultural Gazette of New South Wales*, Vol. XLIII., Part 3.

No. 21.—*Subterranean Clover and Grasses:* Made by Mr. F. O. Ball, of Bugle Ranges, by stacking pasturage which consisted of a mixture of Subterranean Clover with Rye, Soft Brome, Sterile Brome, and Silver grasses, and some Cape weed. Stacked in November, 1931, and weighted, but insufficient weights were used. Sample taken March 15th, 1932.

No. 22.—*Maize:* This is an interesting sample of stack silage, in that the Maize was stacked by Mr. Watkins, of Fulham, in the year 1921. The top was covered over with earth, and was not opened until October, 1931. The color was still good, the texture rather powdery, and on the date of sampling—October 15th, 1931—it contained 82 per cent. moisture.

Green Forages: The analyses of green forages shown for comparison purposes are all of European samples, and are calculated from figures in "The Scientific Feeding of Animals," by O. Kellner.

The figures in Table IX. show very clearly the great differences that exist between the feeding values of different samples of Silage, and as all the instances given are of the one type of foodstuff, *i.e.*, succulent roughage, the figures are strictly comparable. The three figures of importance when estimating the value of the respective samples are those for ***protein, starch equivalent,*** and ***nutrient ratio*** because this type of foodstuff is generally used for the production of milk, or for maintaining animals in times of shortage of pastures. When the palatability of two foodstuffs of the same type is equal, a comparison between the *starch equivalents* of the two shows their relative values for maintaining or fattening animals. As *protein* is of great value in encouraging the secretion of milk, the quantity present decides how valuable, in this connection, any given foodstuff is likely to prove, but as the non-nitrogenous portions of the food are utilised to produce heat, energy, and fat, the relation between the *protein* and various *nitrogen-free substances*, or what is known as the *nutrient ratio*, is nearly as important as the actual content of *protein*.

Perhaps the best way to compare foodstuffs of the one kind is to study the *starch equivalent* figures first, which will show their respective values for fattening or for maintenance purposes, and then give attention to the combination of *starch equivalent* and *nutrient ratio*, to see which are the best for the production of milk and muscle. A foodstuff with a fairly high *starch equivalent* and a fairly narrow *nutrient ratio* is a much better fodder on which animals can produce milk and maintain their condition, than is one with a very high *starch equivalent* and a wide *nutrient ratio*, or one with a low *starch equivalent* and a very narrow *nutrient ratio*.

In comparing the Silages shown in Table IX., it will be seen that Sample No. 10 is of outstanding quality, having the really high *starch equivalent* of 13.0 per cent., and the very narrow *nutrient ratio* of 1 to 3.9. Although lucerne is a highly nitrogenous foodstuff, of first class quality for the production of milk, when fed as a green forage, and has the narrow *nutrient ratio* of 1 to 3.7, its *starch equivalent* is only 9.8 per cent., it is not nearly so good a general livestock foodstuff as is Sample No. 10. Again, Sample No. 22 has the very high *starch equivalent* of 13.6 per cent., but it is obviously a poor milk producer, because its *nutrient ratio* is only 1 to 12.4. The value of the addition of Field Peas to Barley is shown by comparing Samples Nos. 3 and 4 with Sample No. 9; the Barley silage shows only 9.8 per cent. as *starch equivalent*, and a *nutrient ratio* of 1 to 9.3, whereas the mixtures of Barley and Peas have nearly 1 per cent. more *starch equivalent*, and a *nutrient ratio* narrowed down to a little more than 1 to 6. The differences between Silages made from the one kind of forage are clearly brought out by these comparisons as can be easily seen if Sample No. 10 is compared with Sample No. 21. The latter has a *starch equivalent* of 9.6 per cent. against 13.0 per cent., and its *nutrient ratio* is 1 to 7.9 against 1 to 3.9. Further, the Wheat Silage in Sample No. 15, with its 11.3 per cent. of *starch equivalent* and a *nutrient ratio* of 1 to 6.4, shows to advantage when compared to another Wheat Silage, also from a stack, as represented by Sample No. 18, where the *starch equivalent* is 10.2 per cent. and the *nutrient ratio* 1 to 7.0.

These instances are sufficient to show that it is possible to compare foodstuffs of the same kind, if the composition and digestibility of all of them are known, and this information is essential before it is possible to put a value on the various foodstuffs which livestock husbandmen have to handle.

FEEDING SILAGE TO FARM ANIMALS.

All farm animals which ordinarily consume pasture plants are attracted by the palatability of Silage, and when it has been properly made they eat it readily, and in most cases do well on it. For some kinds of livestock, however, it has such disadvantages as to preclude it from ever becoming a prominent foodstuff for them. In a general way it may be taken that because of the losses in manufacture, the making of Silage is a fairly expensive operation, and as its outstanding advantage is the providing of a succulent foodstuff at times when the other available foods are dry, it generally proves economic only for those animals in urgent need of succulent foodstuffs. Because of this Silage can be looked upon as essential for dairy cows if the most is to be got out of them, useful for the ewes of high-class sheep studs, and very valuable for sheep and cattle in times of drought, but of considerably less value for horses, pigs, and poultry.

Silage for Dairy Cows.

For dairy cows to give maximum returns it is essential that they be provided with succulent feed throughout their lactation period, and in most localities this is only possible if some of the surplus green forage of the flush of the season has been stored as Silage for use in the time of shortage. Because of this, Silage is looked upon in some dairying districts as being essential if the cows are to prove fully profitable. Not only does Silage, fed when green feed is short, keep up the flow of milk, but it is a matter of common observation that even when good pastures are available, the addition of Silage to the cows' ration practically invariably leads to an increase in the quantity of milk produced. This happening often encourages people to claim that Silage should form part of the ration throughout the year, but there are few dairymen who go as far as this in the use of Silage.

Besides promoting an increased milk flow Silage is a safe feed, having a laxative effect on cows, and is particularly useful when fed before calving, in fitting the cow to calve with ease, and to clean properly after calving. It is a noted fact that cows fed regularly on Silage remain in better health than those not receiving it, no matter what other kind of feed they are provided with.

Silage will maintain cows in good condition even when they get no other feed, but when the cows have to supply milk, even the best of Silage is not an all-sufficient foodstuff. All Silages are too bulky for the amount of nutriment they contain, and they are usually too low in protein and mineral matter content to give best milk yields, and although the addition of first-class Lucerne or Clover hay would often raise the protein content sufficiently high, the mixture still remains too bulky for full results. To enable cows to consume sufficient fodder to keep up a full milk flow, and maintain body weight, it is usually necessary to add some grain concentrates to the mixture of Silage and leguminous hay. The next table gives some rations, including Silage, for cows of different weights, producing various quantities of milk of different quality.

TABLE X.—*Feeding Silage to Cows in Milk.*

Cows.		Silage.	Food Requirements per Day.			
				Grain Concentrates.		
Live Weight.	Milk Produced per Day.		Lucerne or Clover Hay.	If Milk Tests up to 3·5%.	If Milk Tests from 4% to 4·5%.	If Milk Tests 5% and over.
lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
700	10	21	7	—	—	—
	20	21	7	4	5	6
	30	21	7	8	10	12
	40	21	7	12	15	18
800	10	24	8	—	—	—
	20	24	8	4	5	6
	30	24	8	8	10	12
	40	24	8	12	15	18
900	10	27	9	—	—	—
	20	27	9	4	5	6
	30	27	9	8	10	12
	40	27	9	12	15	18
	50	27	9	16	20	24
1,000	10	30	10	—	—	—
	20	30	10	4	5	6
	30	30	10	8	10	12
	40	30	10	12	15	18
	50	30	10	16	20	24
1,100	10	33	11	—	—	—
	20	33	11	4	5	6
	30	33	11	8	10	12
	40	33	11	12	15	18
	50	33	11	16	20	24

The rations set out above would be varied according to circumstances. For instance, if Silage was plentiful and grain concentrates not readily available, more Silage and less concentrates would be used, or if the Silage was made from Lucerne or Clover, less leguminous hay would be required. It sometimes proves more economic not to purchase grain concentrates, and then the fodder given to the cows might consist of 40lbs. to 60lbs. of Silage per day, and what grazing they can get in the fields, or from 30lbs. to 60lbs. of Silage may be the daily allowance, together with all the leguminous hay that the animals will eat.

Silage does most good in keeping up the flow of milk, when the cow has not been allowed to go back because of the lack of succulent feed, and so dairymen should commence feeding Silage before the pastures have dried towards the end of the Summer, rather than wait until all succulence has left the grazing fields.

When commencing to feed Silage to cows for the first time in the season, it is as well to get them used to it gradually by giving about 5lbs. per head, twice a day, and then regularly increasing the supply until they are on a full ration.

To simplify the work, and to save time, it is customary with some dairymen to feed Silage to the cows while they are being milked in the bails, but this is not a good practice, because with certain samples of Silage there is a risk of some of the strong odor being absorbed by the milk. The correct time to give the cows access to Silage is immediately after milking, rather than during milking, or immediately before.

Silage should never be distributed on the surface of the ground for milking cows, but should always be given to them in feeders of some kind.

As the succulence of this kind of fodder is one of its greatest advantages, it should only be taken from the silo or stack immediately before giving it to the cows, or if the two daily feeds are to be removed in the morning, the allowance for the afternoon feed should be protected in some way so that it does not dry out.

SILAGE FOR OTHER CATTLE.

It is generally recognised that bulls should not receive too much Silage in their ordinary rations, but in most places it is considered quite safe to let them have from 12lbs. to 15lbs. per day, fed in conjunction with good cereal hay and a little grain concentrates.

Calves utilise Silage to good advantage, but should not have access to this kind of foodstuff until they are about two months old, after which time it is safe to let them have, twice a day, all they will clean up shortly after it is given to them. Silage is not all-sufficient for calves, and must be supplemented by good chaff and grain concentrates.

Ordinary, well-preserved Silage will maintain dry cows and steers in good condition, even though they receive no other fodder, and it is quite safe to feed to them all that they can eat, still they do better if Silage only forms part of their ration. A good ration for dry cows is 30lbs. to 40lbs. Silage and 6lbs. to 8lbs. leguminous hay per day, on which the animals will do well, and calve with ease.

In some countries it is usual to hand-feed fattening steers, and when this is the general practice Silage is frequently used as the principal roughage, and usually with good results. When stored as an insurance against drought, it proves most useful for cattle, because there is no foodstuff which keeps the suffering animals in such good health during these periods of extreme shortage of fodder.

SILAGE FOR SHEEP.

In this country Silage is used for sheep of two kinds—for ewes in valuable studs and for the ordinary flock in times of drought. When it is desired to have the ewes to lamb in the early Autumn, before the green feed has started, there is no foodstuff that helps the ewes more than does Silage. If fed to them some few weeks before they are due to lamb, the ewes keep in good condition, deliver big, well developed lambs, which make rapid progress from birth onwards. If there is some picking in the fields the Silage can be fed at the rate of 3lbs. to 4lbs. per ewe per day with excellent results, but if the dry feed is poor, a little grain should be put in the troughs with the Silage.

For ordinary flock sheep being fed in times of drought, 2lbs. to 3lbs. of Silage is sufficient when there is a picking in the paddocks, but when there is little dry feed about the quantity should be increased to about 4lbs. per head per day.

If fed to lambs they should be allowed to become accustomed to it gradually, otherwise they might scour when first given large quantities of it.

SILAGE FOR HORSES.

It takes so little mould or other fungi to upset the digestive system of horses, and Silage is so liable to contain such growths that this forage is not looked upon with favor by horse masters. If, however, the Silage is in first class condition with no sign of mould, it can be used as a part of the ration for resting horses. It tends to make working horses too soft, and is generally considered to be unsafe for brood mares.

If horses are gradually accustomed to it, they can usually make good use of about 15lbs. to 20lbs. of good, sound Silage per day fed in conjunction with good hay and some grain.

SILAGE FOR PIGS.

Silage cannot be looked upon as a good foodstuff for pigs, and at best can only take the place of pasture or other greenstuff in times of shortage. Pigs eat good Silage readily enough, but the waste of material is considerable, and it should only be given to them to keep them healthy when green feed and skim-milk are not available.

SILAGE FOR POULTRY.

When free from moulds, Silage is quite useful for poultry, and particularly for laying hens, but unless extremely large numbers of poultry were being handled it would not be economic to specially make Silage for them. On the other hand, when chaffed Silage is being removed from the silo for other stock, some of it could be given to the poultry if there was a shortage of green feed at the time.

SUMMARY.

1. Silage is the name given to luscious green forage preserved in such a way that it retains its succulence, palatability, and digestibility, whilst the word "silo" stands for the receptacle in which the Silage is made.

2. Silage is made by cutting forage plants when very green and succulent, and storing the forage under pressure, usually in air-tight receptacles, but sometimes in stacks.

3. The palatability and digestibility of practically all forage plants are increased by converting them into Silage.

4. When live plants are thrown together in a heap the cells continue to breathe, and if the heat evolved whilst using up the free oxygen is not sufficient to kill the cells, they begin extracting oxygen from their own materials.

5. After the death of the cells, ferments and bacteria become active, and continue until the heat developed, or the acids formed, kill their activities.

6. Successful Silage-making depends on controlling these ferments and bacteria so that there is neither too much heat nor too much acid formed. It is done by regulating the amount of air in the forage, which is brought about by hastening or delaying the putting of the forage together, and then by applying weights to squeeze the surplus air out of the mass, and prevent its re-entry.

7. The principal physical changes brought about in Silage-making consist of changing the color of the forage to a brownish shade, flattening out the plants, developing characteristic flavors, which vary from acid to nutty, and the evolution of a peculiar odor.

8. Silage cannot be made without fairly considerable losses of feeding material.

9. The forage to be preserved as Silage should be cut whilst green and sappy, and be put into the silo or stack whilst still fresh and unwilted.

10. Cereals should be cut for Silage soon after heading, strong leguminous plants when the bottom leaves are beginning to yellow, clovers and similar plants after they have passed full bloom, maize when the grains are becoming glazed, sorghums when the bottom leaves are drying, sunflowers when showing color in most flower-heads, and grasses when well out in head.

11. Immature growth tends to make mushy Silage, whilst over-mature crops are usually too dry to make good Silage without the addition of water.

12. Rain falling during Silage making does no damage to the forage.

13. A nutty-flavored Silage with pleasant odor, is usually made when some forage is put in the silo for each of 6 to 12 days, and weights are applied as soon as the filling is completed. A minimum of 3ft. and a maximum of 8ft. should be put in the silo each day.

14. When the silo is filled quickly and the weights added soon, greener, but more acid and less attractive Silage is made.

15. Best quality Silage can be made whether the forage is chaffed or left whole. Chaffing facilitates the filling and emptying of silos, whilst whole material is essential for stacks.

16. Forage that is low in moisture content, because of approaching maturity or from exposure, should be moistened with water whilst being converted into Silage.

17. The amount of weight required to properly consolidate Silage varies with the method of manufacture. In tall, narrow silos 100lbs. per square foot of top surface should be applied, in shallow pits and trenches about 200lbs. per square foot, whilst for stacks the weight should be about 300lbs. to 400lbs. per square foot.

18. Dead weight gives better results than mechanical appliances requiring frequent attention.

19. "Sweet" Silage is made when the temperature is allowed to approach 130°F. before being checked, whilst "sour" Silage results if the temperature is not allowed to reach 120°F.

20. There is little to choose between "sweet" and "sour" Silage.

21. Only good fodder will make good Silage, and the better the fodder the better the Silage made from it.

22. The plants to be used for Silage will depend wholly on what can be grown to best advantage.

23. The sides of a silo should be as near perpendicular and smooth as possible, and should contain no projections, so that in sinking the whole mass goes down regularly and evenly.

24. The silo should be deep in proportion to its other dimensions.

25. Overhead silos have so many advantages over all other types that they have almost superseded underground silos where much Silage is made.

26. Overhead silos can be constructed of any material which can be made airtight, and which is strong enough to withstand the considerable pressure from inside.

27. Reinforced concrete silos are the most permanent structures of all forms of silos, and are the most satisfactory.

28. Overhead silos made of stone, brick, or masonry blocks are quite satisfactory, provided iron hoops, in the form of tightening bolts, are placed round the structure in several positions.

29. Where timber is plentiful, satisfactory wooden silos can be made.

30. Silos lined with iron last for years if coated annually with tar, pitch, or bitumen.

31. Pits lined with masonry make convenient silos, particularly if constructed in a steep hill or high bank.

32. Trenches from 6ft. to 10ft. in depth are suitable for making Silage, particularly for the storage of forage as a reserve for times of drought.

33. The cheapest method of making Silage is in stacks, and the forage is just as good as from the best silo, provided that the stack has not stood for too long a time.

34. When commencing to build a Silage stack care must be shown to make quite certain that the base of the stack is not too large for the material available.

35. Plenty of weight must be used on a stack of Silage, and it should be put in position as soon as the stack is completed.

36. Salt should not be added when making Silage, but the addition of 28lbs. to 56lbs. of finely ground Raw Rock Phosphate per ton of fodder will improve the Silage and benefit livestock.

37. Good Silage gives better results than green forage if the latter is cut and carted to the animals.

38. Silage is more palatable than other ordinary foodstuffs, and keeps up the appetite of animals so that they consume more.

39. The addition of Silage to a ration increases the palatability of all constituents of the ration.

40. Silage keeps animals in good health, loosens their skins, puts "bloom" on them, prevents impaction, and overcomes the bone-chewing habit. It is particularly valuable in reducing trouble during parturition.

41. Silage can be fed to livestock any time after the completion of the filling of the silo, but the quality is better if left for about a month. In the case of stacks they should be left unopened for 10 to 12 weeks if possible to do without the fodder.

42. In removing the Silage a shallow layer from 1in. to 3in. at least should be scraped off the whole surface of the material in the silo each day, without loosening any not to be removed. A hole should never be dug into the Silage.

43. In trenches and stacks the exposed end of Silage should be vertical, and a thin slice be taken off the whole face. The slice should be of such a thickness that it will not take more than three to six days before a fresh slice will be started.

44. When forages of the one kind are to be used for (*a*) maintenance or fattening, or (*b*) milk production, they can be compared by studying a combination of *starch equivalent* and *nutrient ratio*. A high *starch equivalent* means a good fattening or maintenance foodstuff, a narrow *nutrient ratio* means a good milk producer, but a forage with a fair *starch equivalent* and a fairly narrow *nutrient ratio* is a much better foodstuff on which animals can produce milk and maintain their condition, than is one with a very high *starch equivalent* and a wide *nutrient ratio,* or one with a low *starch equivalent* and a very narrow *nutrient ratio.*

45. The addition of Silage to a cow's ration practically invariably increases the flow of milk.

46. Cows fed regularly with Silage keep in better health than those not receiving it.

47. All Silages are too bulky for the amount of nutriment and minerals they contain for cows producing much milk, and so for all high-yielding cows, some leguminous hay, such as Lucerne or Clover, as well as some grain concentrates, should be added to the Silage.

48. Cows in milk should be started on Silage before all other fodders have gone dry.

49. Cattle should be gradually accustomed to Silage by commencing with about 5lbs. twice a day.

50. Silage should be given to cows immediately after milking, and not just before.

51. Bulls should only receive from 12lbs. to 15lbs. Silage per day.

52. Calves can be started on Silage after they are two months of age.

53. Silage is a first-class forage for cattle during times of drought, keeping them in better health than most other foodstuffs.

54. When ewes are to be lambed when pastures are dry, Silage is a really good forage for them, particularly if they are started on it some weeks before lambing.

55. There is no better fodder for sheep in times of drought.

56. Only the very best samples of Silage, quite free from moulds, should be given to horses, and even then it should only form part of the ration.

57. Pigs eat good Silage readily, but waste a lot of it.

58. When free from moulds poultry do well on Silage, but it would not be economic to make it specially for them.

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REVIEW OF SOUTH AUSTRALIAN VINTAGE 1931-32.

[By J. L. Williams, Lecturer in Viticulture, Roseworthy College.]

The 1931-32 season proved a very disappointing one for South Australian viticultural interests. The season opened very favorably, with good rains during the wet months (May-September), but October was practically rainless, and towards the latter part of that month two frosts were experienced, the districts principally affected being Clare and Barossa. In these districts considerable damage occurred in both wine and drying varieties. Some damage also occurred in the South Wine Districts and in the Irrigation Settlements, but here the damage was mainly confined to locations subject to late Spring frosts, whereas in the Clare and Barossa Districts the damage was more general. This was the most severe frost experienced for many years in the Non-irrigated Districts.

The early termination of the wet season was particularly unfortunate, as many growers in the Non-irrigated Districts were unable to commence ploughing at the usual time owing to the wet condition of the soil during the period July to September and later found ploughing almost impossible, due to the dry conditions in October. Considerable valuable soil moisture was lost in this way, and vine growth suffered as a consequence. Vineyards with stiff soils were the ones chiefly affected.

During the "growth period" of the vine (October-December) very little useful rain fell, particularly in the Barossa District, as the appended rainfall table will indicate; this also was reflected in the growth of the vine at the end of the season and considerably affected the ripening of the crop.

During the ripening period, January to April inclusive, another unfortunate set of climatic conditions prevailed. March and April were unusually wet, particularly in April, when from 2½in. to 4½in. fell. As a consequence, late ripening varieties such as "Grenache" and "Mataro" suffered considerably through the development of mould and a "Beaume" of above 13.5-14.0 was difficult to obtain. Some fruit was left on the vines, whilst the bulk of the remainder was only fit for distillation purposes.

Drying operations both in the Non-irrigated and Irrigated Districts were greatly hampered, and the quality of fruits on the racks at this stage was considerably lowered, although fruits dried earlier in the season were of an even high standard. In this connection the "standard dip" as advocated by the C.S.I.R. played a prominent part. Late picked fruits, however, had to be processed by using the "hot caustic soda dip" in order to speed up the drying. Growers with dehydrators were making full use of them and many other hydrators were hurriedly installed. This serves to illustrate the necessity for this form of drying, for late pickings, in seasons where adverse drying weather prevails.

Table I.—*Showing Useful Autumn and Winter Rains for Seasons* 1930-31.

In these tables Clare figures are taken to represent the Clare and Watervale Districts, Tanunda the Barossa District, Morphett Vale the Southern Wine Districts, and Waikerie the River Irrigation Settlements respectively.

Month.	Clare.		Tanunda.		Morphett Vale.		Waikerie.	
	1930.	1931.	1930.	1931.	1930.	1931.	1930.	1931.
	In.	In.	In.	In.	In.	In.	In.	In.
May	2·20	3·00	1·30	2·68	1·25	3·30	·52	1·32
June	·72	4·10	·42	3·33	1·75	6·51	·48	1·77
July	2·49	3·39	4·20	3·24	4·67	3·74	1·49	·91
Aug.	3·46	3·10	3·30	3·70	3·15	2·32	1·46	·57
Sept............	1·86	2·85	2·13	3·87	2·30	3·22	·49	1·44
Totals......	10·73	16·44	11·35	16·82	13·12	19·09	4·44	6·01

TABLE II.—*Showing Rain Received during the Growing Period*, 1930-31.

Month.	Clare.		Tanunda.		Morphett Vale.		Waikerie.	
	1930.	1931.	1930.	1931.	1930.	1931.	1930.	1931.
	In.	In.	In.	In.	In.	In.	In.	In.
Oct.	3·56	·78	3·19	·58	2·01	·88	3·83	·47
Nov.	·44	1·13	·44	·34	·69	1·07	·47	·37
Dec.	·56	·74	·61	·69	·77	·28	·81	·12
Totals	4·56	2·65	4·24	1·61	3·47	2·23	5·11	·96

TABLE III.—*Showing Rain Received during the Ripening Period*, 1931-32.

Month.	Clare.		Tanunda.		Morphett Vale.		Waikerie.	
	1931.	1932.	1931.	1932.	1931.	1932.	1931.	1932.
	In.	In.	In.	In.	In.	In.	In.	In.
Jan.	·69	·24	·45	·41	·33	·10	·25	·12
Feb.	·07	1·94	·20	1·25	·23	1·45	·04	1·32
March	1·44	1·72	·88	·76	1·64	1·24	·40	1·10
April	2·56	4·37	1·15	2·26	1·48	3·96	1·07	·82
Totals	4·76	8·27	2·68	4·68	3·68	6·75	1·76	3·36

A glance at the above tables will serve to show that the 1931-32 season opened with good Autumn and Winter rains from approximately 5in. to 6in. better in the Non-irrigated Districts than in 1930-31. This resulted in the subsoil being wetted to a reasonable depth and providing a fair reserve of soil moisture. These were the best subsoil rains received for several seasons and gave growers early cause for optimism concerning the 1931-32 Vintage, and in many instances figures approaching a record were forecast.

However, Nature decided otherwise, and early forecasts had to be considerably modified as the result of a dry Spring and severe frosts. This set-back was later followed by unreasonable ripening weather, resulting in a further decrease in the quantity of fruit harvested as well as interfering with the quality, due to the fruit developing mould and taking up moisture. Despite these reverses the Government Statist (Mr. W. L. Johnston) forecasts an increase over the previous Vintage of 93,966 gallons or 0.93 per cent., based on returns of growers representing 90 per cent. of the previous season's total production. Mr. Johnston provides the following figures:—

FIVE YEARS' WINE STATISTICS.

Year.	Wine Made.			Wine Exported.	
	Total.	Distillation Proportion.	%	Overseas.	Interstate.
	Galls.	Galls.		Galls.	Galls.
1926-27	16,159,595	9,350,588	58	2,265,755	2,583,701
1927-28	12,820,733	6,849,284	53	2,856,806	2,216,875
1928-29	14,828,968	9,414,691	63	1,423,799	1,940,065
1929-30	12,406,017	6,954,436	56	1,840,986	1,910,965
1930-31	10,131,034	4,966,422	49	1,837,986	1,462,554
Five years' mean	13,269,269	7,507,084	57	2,044,977	2,022,832
1931-32. Estimated	10,225,000	(*a*) 5,828,000	57	(*b*) 2,869,747	Not available

(*a*) On average proportion of five years.
(*b*) Eleven months' record.

Early in the season some doubts were expressed concerning the ability of manufacturers for financial reasons and also for lack of storage to absorb the produce of the vineyards. Reduced yields, however, solved this difficulty effectively, if not satisfactorily.

Growers in the Barossa District have, for several seasons, experienced difficulty in selling their produce, and have been processing it co-operatively in privately owned premises. Sufficient success has attended their efforts to induce them to build a winery of their own in readiness for the next Vintage.

The present season has opened auspiciously, even better than the previous season, good soaking Autumn and Winter rains falling over Non-irrigated areas, providing ideal moisture conditions for bud-burst and a satisfactory reserve of soil moisture. Unfortunately the frost experienced in the Spring of 1931 has resulted in the vines in the affected areas being a tangled mass of watershoots. Such vines are but poorly supplied with fruiting wood, and this must affect the crop in the coming season.

We hope that the coming season will not be a repetition of the immediate past season as the growers of the dried vine fruits especially have suffered more than their share of the ironies of fate. A good season last year would have enabled growers to regain some of their losses of past years, the result of low prices.

Vine diseases last year, apart from meteorological disorders, were conspicuous by their absence, as was only to be expected in view of the dry Spring.

WHEAT PRODUCTIVITY CLASSIFICATION 1931-32.

[By H. L. SEMMENS, Acting Government Statist.]

With a view to ascertaining the extent of acreage producing very high and very low returns of wheat per acre, all wheat farms have been classified according to their productivity per acre. The accompanying return sets forth comparative details for the three seasons, 1929-30, 1930-31, and 1931-32.

Compared with the previous season, the total yield was 48,093,102 (34,871,526) bushels, averaging 11.81 (8.34) bushels per acre, and the agricultural areas rainfall, April-November, was 13.27 (11.31) inches. The more favorable season for 1931-32 is reflected in the higher yields:—3,488 (1,733) farmers, or 24.38 (12.35) per cent. harvested 18 bushels per acre and upwards, producing 37.86 (18.52) per cent. of the crop from 19.74 (7.22) per cent. of the total area sown. 39.87 (37.42) per cent. of the farmers harvested 9 and under 18 bushels, and 35.75 (50.23) per cent. less than 9 bushels per acre.

Of the 3,488 farms with average yields of 18 bushels and over, 1,577 were in the Central Division, 1,463 in the Lower North, and only 448 in the remaining four Divisions of the State. Of the 14,306 farms in the State, 9,192, or 64.25 per cent., harvested yields of 9 bushels and over, and 5,114, or 35.75 per cent., yields of less than 9 bushels.

Of the total of 5,114 farms under 9 bushels, the Murray Mallee and Western Divisions had 1,665 and 1,467 respectively. In these Divisions there were 301 and 160 farms under 3 bushels, 710 and 540 with 3-6 bushels, 654 and 767 with 6-9 bushels, and 702 and 1,230 with 9 bushels and over. During the last five seasons the total State acreage under wheat has increased 1,300,000 acres, of which 850,000 acres has been in these two Divisions, and the effect has been to reduce the average yield for the State.

The following are the details in Divisions:—

Divisions.	Average Rainfall April-Nov.*	Average Wheat Yield.	Wheat Farms with Yields of—			
			Under 9 bush.	9–18 Bush.	18 bush. and over.	Total.
	In.	Bush.	No.	No.	No.	No.
Central	16·92	16·26	881	1,796	1,577	4,254
Lower North	12·62	17·64	316	1,422	1,463	3,201
Upper North	9·85	9·76	610	549	178	1,337
South-Eastern	18·14	10·57	175	182	93	450
Western	12·57	9·26	1,467	1,092	138	2,697
Murray Mallee	10·36	7·55	1,665	663	39	2,367
Total, 1931-32 ..	13·27	11·81	5,114	5,704	3,488	14,306
1930–31 ..	11·31	8·34	7,052	5,253	1,733	14,038
1929–30 ..	9·57	6·40	7,833	3,675	1,688	13,196
1928–29 ..	9·39	7·79	7,094	4,619	1,673	13,386
1926–27 ..	13·40	12·84	3,558	6,284	2,896	12,738

* Rainfall average over Agricultural areas only.

Average Area of Wheat Crops per Holding.—Central 146, Lower North 275, Upper North 315, South-East 124, Western 422, and Murray Mallee 403 acres. Total State, 285 acres. There were 1,787 farms with less than 50 acres for wheat, and of those 850 were less than 20 acres.

Productivity of Wheat Areas, South Australia.

Comparative analysis of the productivity of wheat areas per acre for the seasons 1929-30, 1930-31, and 1931-32. Total average inches rainfall in agricultural areas (with April-November totals in parentheses), 1929 12.48 (9.57), 1930 1309 (11.31), 1931 15.11 (13.27).

Production Groups.	No. of Wheat Growers.			Area of Crop.			Production.		
	1929-30	1930-31	1931-32	1929-30.	1930-31.	1931-32.	1929-30.	1930-31.	**1931-32.**
	No.	No.	No.	Acres.	Acres.	Acres.	Bush.	Bush.	**Bush.**
Under 3bush. ...	3,971	1,701	746	1,519,053	676,038	198,233	1,335,780	1,133,943	**363,252**
3 and under 6 .	2,077	2,678	1,960	630,237	969,786	626,884	2,714,327	4,208,643	**2,817,122**
6 and under 9 .	1,785	2,673	2,408	460,693	925,445	830,579	3,384,144	6,834,025	**6,139,473**
9 and under 12 .	1,499	2,279	2,131	345,759	647,462	685,958	3,555,757	6,697,991	**7,102,321**
12 and under 15 .	1,236	1,678	1,875	238,332	398,612	516,035	3,159,204	5,281,032	**6,826,644**
15 and under 18 .	940	1,296	1,698	172,699	261,328	409,772	2,801,985	4,258,564	**6,632,745**
18 and under 21 .	636	851	1,347	115,228	167,191	326,576	2,210,089	3,201,863	**6,318,102**
21 and under 27 .	697	706	1,557	118,089	114,762	357,169	2,771,387	2,661,654	**8,326,212**
27 and under 33 .	254	154	501	34,461	17,904	108,274	1,009,276	523,120	**3,141,809**
33 and up	101	22	83	11,213	1,985	11,890	403,144	70,691	**425,422**

SUMMARY TOTALS.

Total under 9 ...	7,833	7,052	5,114	2,609,983	2,571,269	1,655,696	7,434,251	12,176,611	**9,319,847**
Per cent to total.	(59·36)	(50·23)	(35·75)	(71·59)	(61·51)	(40·67)	(31·84)	(34·92)	**(19·39)**
Total 9 to 18 ...	3,675	5,253	5,704	756,790	1,307,402	1,611,765	9,516,946	16,237,587	**20,561,710**
Per cent. to total.	(27·85)	(37·42)	(39·87)	(20·76)	(31·27)	(39·59)	(40·77)	(46·56)	**(42·75)**
Total 18 and up..	1,688	1,733	3,488	278,991	301,842	803,909	6,393,896	6,457,328	**18,211,545**
Per cent. to total.	(12·79)	(12·35)	(24·38)	(7·65)	(7·22)	(19·74)	(27·39)	(18·52)	**(37·86)**
Grand total ...	13,196 (100·00)	14,038 (100·00)	14,306 (100·00)	3,645,764 (100·00)	4,180,513 (100·00)	4,071,370 (100·00)	23,345,093 (100·00)	34,871,526 (100·00)	**48,093,102 (100·00)**

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1—WHITE LEGHORNS.

Competitors.	Address.	Score to Month ending August 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals.
Austwick, S.	West Marden	(1) 65	(2) 86	(3) 60	211
Barker, C. R.	Edwardstown	(4) 66	(5) 70	(6) *	136
Bolland, H.	Knoxville	(7) *	(8) 71	(9) 40	111
Butson, A.	Clarence Park	(10) 74	(11) 59	(12) 82	215
Carmichael, A. B.	Woodville West	(13) 62	(14) *	(15) *	62
Carroll & Leedham	Forest Gardens	(16) 61	(17) 63	(18) 66	190
Carter, W. A.	Glandore	(19) 57	(20) 91	(21) 41	189
Cleland, W. L.	Beaumont	(22) 48	(23) 66	(24) †	114
Cooke, B.	Kanmantoo	(25) 29	(26) 64	(27) 97	190
Cooper, Syd.	Edwardstown	(28) 61	(29) 54	(30) 46	161
Crawford, L. H.	Grange	(31) 97	(32) 24	(33) 53	174
Crittenden, R. C.	Kilkenny North	(34) 68	(35) 100	(36) 95	263
Dawes, A. G.	Glenunga Gardens	(37) 93	(38) 59	(39) 86	238
Dawes, A. G.	Glenunga Gardens	(40) 57	(41) ‡	(42) ‡	57
Dawes, A. G.	Glenunga Gardens	(43) 95	(44) 57	(45) *	152
Dawes, A. G.	Glenunga Gardens	(46) 89	(47) 67	(48) 61	217
Dawes, A. G.	Glenunga Gardens	(49) 40	(50) 53	(51) 93	186
Dawes, A. G.	Glenunga Gardens	(52) 52	(53) 108	(54) 64	224
Dawes, A. G.	Glenunga Gardens	(55) 76	(56) 65	(57) 72	213
Duhring, T.	Mallala	(58) 61	(59) 52	(60) 70	183
Easther, Colin J.	Black Forest	(61) 81	(62) 56	(63) 93	230
Edgcumbe, J. L.	Plenty, Victoria	(64) 80	(65) 86	(66) *	166
Fidge, H.	Clarence Park	(67) 33	(68) 75	(69) *	108
Fox, Russell H.	Edwardstown	(70) 35	(71) 20	(72) 77	132
Gilbert, L. H.	Glanville Blocks	(73) 33	(74) *	(75) 68	101
Goldsmith, Keith	Kensington	(76) 84	(77) *	(78) *	84
Gore, A. G.	Summertown	(79) 100	(80) *	(81) 83	183
Gurr, A. & H.	Scott's Creek	(82) 32	(83) 87	(84) *	119
Hefford, H. H.	Murray Bridge	(85) *	(86) *	(87) 59	59
Hefford, H. H.	Murray Bridge	(88) 89	(89) 51	(90) *	140
Hillyer, Jas.	Kilkenny	(91) 61	(92) 85	(93) 86	232
Hodgson, W. H. A.	Salisbury	(94) 32	(95) 26	(96) 41	99
Lamerton, E. A.	Edwardstown	(97) 70	(98) 70	(99) *	140
Lindquist, E. F.	Semaphore Park	(100) *	(101) 82	(102) 97	179
Lindsay, Mrs. P. G.	Croydon	(103) 55	(104) 45	(105) ‡	100
Morris, H.	Seaton Park	(106) 62	(107) ‡	(108) 37	99
McPherson, K. R.	Blackwood	(109) ‡	(110) ‡	(111) 14	14
Nicholls, H. R.	Eden Hills	(112) *	(113) *	(114) ‡	—
Oliver, J. H.	Goodwood Park	(115) 52	(116) *	(117) *	52
Radbone, T. B.	Colonel Light Gdns.	(118) 55	(119) 58	(120) 77	190
Rassmussen, H. A.	Ethelton	(121) 68	(122) 57	(123) *	125
Woodbury Poultry Farm	Crafers	(124) *	(125) 38	(126) 61	99
Woodbury Poultry Farm	Crafers	(127) 63	(128) 80	(129) 91	234
Rowe, Bruce	Two Wells	(130) 92	(131) *	(132) 68	160

Egg-laying Competition—Section 1—White Leghorns—*continued.*

Competitors.	Address.	Score to Month ending August 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 41	(134) ‡	(135) 92	133
Slape, W. C.	Magill	(136) 97	(137) 45	(138) 92	234
Thomas & Elson	Hawthorn	(139) 67	(140) 50	(141) 63	180
Thomas & Elson	Hawthorn	(142) 66	(143) 71	(144) 89	226
Vowels, C. C.	Westbourne Park	(145) 70	(146) 82	(147) *	152
Welford, F. F.	Colonel Light Gdns.	(148) 33	(149) 42	(150) 76	151
Urlwin, A. P.	Balaklava	(151) 41	(152) 57	(153) 57	155
Wiese, W.	Cabra	(154) †	(155) 31	(156) *	31
Wiese, W.	Cabra	(157) *	(158) *	(159) *	—
Williams, F. J.	Millswood Estate	(160) *	(161) 60	(162) *	60
Williams, W. R.	Frewville	(163) 53	(164) 88	(165) †	141
Williams, W. R.	Frewville	(166) 97	(167) 51	(168) 73	223
Woodley, W.	Tailem Bend	(169) 49	(170) 53	(171) 63	165
Connor, D. C.	Gawler	(172) ‡	(173) 76	(174) 71	147
Tolhurst, A. E.	Torrens Park	(175) 32	(176) *	(177) 63	95
Gurr, A. & H.	Scott's Creek	(202) *	(203) *	(204) 81	81
Totals		3,076	2,831	2,798	8,705
Section 2—Any other Light Breed.					
Black Minorcas.					
Gameau, V. F.	Woodville	(178) 28	(179) 51	(180) 45	124
Totals		28	51	45	124
Anconas.					
Williams, W. R.	Frewville	(181) 29	(182) 35	(183) *	64
Totals		29	35	*	64
Section 3—Black Orpingtons.					
Richardson, N. F.	Woodville	(184) 82	(185) 98	(186) 92	272
Cook, Arthur	Colonel Light Gdns.	(187) 93	(188) *	(189) ‡	93
Cooke, B.	Kanmantoo	(190) *	(191) *	(192) 81	81
Crago, Jack	Prospect	(193) 46	(194) 53	(195) ‡	99
Crawford, L. H.	Grange	(196) 94	(197) 50	(198) 44	188
Dowling, J. H.	Glossop	(199) *	(200) *	(201) *	—
Hudson, F. J.	Prospect	(205) 106	(206) 66	(207) *	172
Mills, H. J.	Edwardstown	(208) 41	(209) 81	(210) 109	231
Mills, H. J.	Edwardstown	(211) 67	(212) 112	(213) *	179
Rawe, J.	Seaton Park	(214) 97	(215) *	(216) *	97
Schubert, B. O.	Tanunda	(217) 13	(218) *	(219) 42	55
Frisby Smith, G.	Fulham	(220) 37	(221) 61	(222) 88	186
Twartz, H. L.	Gawler	(223) 91	(224) 65	(225) 87	243
Williams, W. R.	Frewville	(226) 112	(227) ‡	(228) 23	135
Williams, W. R.	Frewville	(229) 47	(230) 92	(231) *	139
Woodley, W.	Tailem Bend	(232) *	(233) 97	(234) 100	197
Totals		926	775	666	2,367
Section 4—Any other Heavy Breed.					
Rhode Island Reds.					
Fidge, H.	Clarence Park	(235) 66	(236) 48	(237) 29	143
Gameau, V. F.	Woodville	(238) 94	(239) 47	(240) ‡	141
Williams, W. R.	Frewville	(241) 82	(242) 51	(243) 67	200
Totals		242	146	96	484

*** Denotes disqualified under Rule 13. ‡ Denotes did not lay during July. † Dead.**

BUTTERFAT TESTS (OFFICIAL) FOR YEAR ENDED COWS AND OF PURE BREDS WHICH ON JUNE 30TH,

Particulars of Registration.	Name of Cow.	Owner.	Breed.	Calved.
				JUNIOR TWO-YEAR-OLDS—
C.R. only	Glenowie Netherland Mary	H. Mountstephen, Monteith	Friesian	25/10/30
App. 1	Murray Glen Netherland Flower	C. J. Morris, Monteith	"	17/10/30
C.R. only	Glenowie May Echo	H. Mountstephen, Monteith	"	16/7/31
"	Glenowie Princess Posch	H. Mountstephen, Monteith	"	18/7/31
"	Glen Murray Netherland Florence	T. J. H. Dodd, Mypolonga	"	-/7/31
"	Barina Duchess Helen	L. H. & P. C. Giles, Auburn ...	"	28/5/31
				SENIOR TWO-YEAR-OLDS—
App. Vol. 8	Gaygirl of Strathearn	E. A. Groth, Walker's Flat	M.S.	Nov/1930
C.R. only	Glenowie Netherland Pauline ...	H. Mountstephen, Monteith	Friesian	July/1931
				JUNIOR THREE-YEAR-OLDS—
C.R. only	Glenowie Inka May	H. Mountstephen, Monteith	Friesian	Nov/1930
App. D	Gay Maid of Strathearn	E. A. Groth, Walker's Flat	M.S.	June/1930
App. D	Gayflower of Strathearn	E. A. Groth, Walker's Flat	"	Dec/1930
				MATURE COWS—BUTTERFAT
App. 1	Murray Glen Griselda's Royal ..	C. J. Morris, Monteith	Friesian	July/1931
App. D	Duchess 2nd of Strathearn	E. A. Groth, Walker's Flat	M.S.	Jan/1930
App. D	Countess of Strathearn.........	E. A. Groth, Walker's Flat	"	Dec/1930
App. D	Ruby 2nd of Strathearn	E. A. Groth, Walker's Flat	"	Dec/1930
App. D	Sally of Strathearn	E. A. Groth, Walker's Flat	"	Dec/1930
App. D	Princess of Strathearn	E. A. Groth, Walker's Flat	"	Dec/1930

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JULY, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.		Average Test.
			Per Herd during July.	Per Cow during July.	Per Herd during July.	Per Cow during July.	
			Lbs.	Lbs.	Lbs.	Lbs.	%
7/E	23	15·90	11,665½	507·19	475·45	20·67	4·08
7/H	10	8·90	6,293½	629·35	313·49	31·35	4·98
7/K	20	20	20,661½	1,033·08	838·93	41·95	4·06
7/L	32·13	21·32	18,127½	564·18	909·61	28·31	5·02
7/T	11	3·42	2,221	201·91	98·54	8·96	4·44
7/W	19	12·03	8,906	468·74	387·30	20·38	4·35
7/Y	19·90	18·90	13,295	668·09	633·83	31·85	4·77
7/AA	11·68	9·13	4,181	357·96	217·45	18·62	5·20
7/HH	16	11·42	5,651½	353·22	259·96	16·25	4·60
7/KK	22·10	15·23	11,403	515·97	506·42	22·91	4·44
7/LL	14	9·90	6,120	437·14	260·03	18·57	4·25
7/MM	31·68	29·06	27,139½	641·02	1,063·30	33·56	3·92
7/NN	22·77	14·87	10,860	476·94	470·26	20·65	4·33
7/OO	16	12·71	9,258½	578·66	452·76	28·30	4·89
7/PP	10·65	6·65	6,255	587·32	339·52	31·88	5·43
7/QQ	13	11·23	6,472	497·84	377·96	29·07	5·83
7/TT	16	13·42	9,644	602·75	463·12	28·95	4·80
7/UU	21·87	16·23	12,894	589·57	642·05	29·36	4·98
7/VV	12·77	8·55	7,533½	589·93	421·35	33·00	5·59
7/WW	15·84	7·55	6,095½	384·81	311·41	19·66	5·11
7/XX	14·29	13	11,695	818·40	637·02	44·58	5·45
7/YY	13	8·32	4,218	324·46	201·55	15·50	4·78
7/ZZ	18·10	13·42	4,906	271·05	198·67	10·98	4·05
Means	17·60	13·09	9,804·17	557·08	455·65	25·89	4·65

JUNE 30TH, 1932, OF FOUNDATION AND APPENDIX 1932, WERE REGISTERED IN CALF ROLL ONLY.

Age at Calving.		Total Milk.	Average Test.	Total Butterfat.	Days Tested.	Sire.	Remarks.
Yrs.	Mths.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 230LBS.							
2	—	10,117½	3·24	327·54	273	Longbeach Netherland King 2nd	—
1	11	8,665½	3·68	319·27	273	Longbeach Netherland King 2nd	—
1	9	7,821	3·81	297·99	273	Murray Glen Prince Wooraki	—
1	5	7,696½	3·18	244·95	273	Murray Glen Prince Wooraki	—
2	3	1,410	3·63	51·18	30	Evandale Netherland Duke	Herd withdrawn
1	7	1,605	3·11	49·92	60	Barina Woodcrest Paul	Withdrawn
BUTTERFAT STANDARD, 250LBS.							
2	10	7,173	4·36	312·96	273	Gayboy	—
2	7	9,657	3·24	312·69	273	Longbeach Netherland King 2nd	—
BUTTERFAT STANDARD, 270LBS.							
3	2	12,453	3·10	385·76	273	River Glen Sir Pietje Griselda	—
3	6	6,733½	4·61	310·63	273	Gayboy	—
3	—	6,286½	4·41	277·34	273	Gayboy	—
STANDARD, 350LBS.							
5	4	11,290½	4·01	452·28	273	River Glen Lord Echo Griselda	—
6	3	9,621	4·23	407·08	273	Wallis	—
6	5	7,920	4·60	363·95	273	Gayboy	—
6	6	8,730	3·98	347·65	273	Gayboy	—
6	3	6,900	3·97	274·20	210	Gayboy	Withdrawn
7	1	5,400	4·42	238·52	210	Gayboy	Withdrawn

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JULY, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during July.	Per Cow during July.	Per Cow October to July.	Per Herd during July.	Per Cow during July.	Per Cow October to July.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C....	34	24·03	18,352½	539·78	5,145·02	937·64	27·58	262·46	5·11
5/D ...	29·90	25·55	19,831	650·40	4,977·82	1,117·68	36·68	264·69	5·64
5/E ...	45	34·94	24,322	540·49	4,572·88	1,308·77	29·08	241·90	5·38
5/L ...	18·74	18·74	16,679½	890·05	5,751·24	850·76	45·40	285·65	5·10
5/R ...	57·26	38·97	15,891½	277·53	3,359·42	692·02	12·09	142·35	4·35
5/S ...	22	17·65	8,675	394·32	3,842·47	495·84	22·54	202·35	5·72
5/U ...	27	18·48	17,475½	647·24	7,589·17	759·70	28·14	326·83	4·35
5/Y ...	24·32	19·42	12,957½	532·79	6,032·11	713·93	29·36	320·90	5·51
5/AA ..	16	14·35	5,355½	334·72	3,806·64	326·80	20·43	205·88	6·10
5/DD .	20·94	17·45	10,739½	512·87	5,206·58	628·43	30·01	294·17	5·85
5/EE ..	17·68	11·84	12,828½	725·59	5,753·41	667·19	37·74	303·17	5·20
5/II ...	26·03	21·32	14,139½	543·20	5,446·08	769·33	29·56	266·30	5·44
5/JJ ..	27·84	15·35	15,056½	540·82	4,574·22	634·78	22·80	201·21	4·22
5/KK .	19·10	18·10	8,601	450·31	5,355·65	451·45	23·64	261·07	5·25
5/MM .	16	12·71	6,902½	431·41	4,390·42	380·25	23·77	222·85	5·51
5/NN .	26·87	19·94	13,040½	485·32	5,022·19	703·75	26·19	240·38	5·40
5/OO ..	21·45	13·68	6,455	300·93	4,562·70	313·36	14·61	212·78	4·85
5/PP ..	31	26·42	18,254	588·84	4,424·54	853·61	27·54	216·03	4·68
5/QQ ..	17·65	14·94	7,418	420·28	4,275·67	411·91	23·34	225·87	5·55
5/RR ..	22	21·48	12,674½	576·11	Dec.-July 3,198·37	743·25	33·78	Dec.-July 175·12	5·86
5/SS ..	14·06	6·45	2,394½	170·30	3,001·75	128·73	9·16	145·22	5·38
Means .	25·47	19·61	12,764·00	501·17	4,805·45	661·39	25·97	238·22	5·18

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JULY, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during July.	Per Cow during July.	Per Cow Dec. to July.	Per Herd during July.	Per Cow during July.	Per Cow Dec. to July.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ...	20	18·81	13,731½	686·58	3,674·11	609·54	30·48	166·34	4·44
6/C....	17·84	15·94	16,095	902·18	4,387·05	605·98	33·97	182·51	3·77
6/F ...	23·45	22·32	23,102	985·16	4,853·72	1,099·12	46·87	238·18	4·76
6/H ...	28	23·10	23,251½	830·42	3,764·97	1,047·28	37·40	176·93	4·50
6/O ...	17	12·35	9,811½	577·15	3,767·93	506·63	29·80	197·75	5·16
6/X ...	20	17	10,720½	536·02	4,873·99	484·45	24·23	208·63	4·52
6/Y ...	20·94	17·10	9,462	451·86	3,541·19	380·01	18·15	158·48	4·02
6/Ee ..	43·77	27·65	10,843½	247·74	3,127·33	494·82	11·29	146·43	4·56
6/Ii ...	30	22·19	12,225	407·50	4,643·31	542·72	18·09	214·07	4·44
6/Kk .	20	12·10	5,805	290·25	3,750·75	242·54	12·13	171·72	4·18
6/Ll ..	22·03	19·19	11,440½	519·31	4,153·38	463·50	21·04	172·69	4·05
6/Oo ..	17	12·13	8,496	499·76	5,427·83	390·05	22·94	253·32	4·59
6/Pp ..	17·87	15·52	11,052½	618·49	4,868·58	565·05	31·62	287·89	5·11
6/Qq ..	25	16·55	12,055	482·20	5,067·73	535·52	21·42	230·77	4·44
6/Rr ..	28·45	19·77	16,123	567·05	5,000·43	678·98	23·89	222·70	4·18
6/Tt ..	21·58	20	12,602	583·96	4,753·62	534·14	24·75	223·97	4·24
6/Uu .	29·35	22·19	14,026½	477·90	4,023·24	600·04	20·44	179·00	4·28
6/Vv ..	26·65	21·97	17,811½	668·35	5,544·77	846·42	31·76	259·35	4·75
6/Xx .	24·81	18·97	12,781	515·15	4,679·79	570·74	23·00	207·50	4·47
6/Yy .	24·42	21·35	8,832½	361·69	4,230·34	458·63	18·78	219·95	5·19
6/ZZ ..	20	19·55	15,155½	757·78	5,401·30	703·24	35·16	252·96	4·64
6/Aaa .	18	8·87	6,631	368·44	2,598·65	377·23	20·96	138·81	5·56
Means .	23·46	18·39	12,820·66	546·45	4,302·71	578·92	24·67	199·80	4·52

ROUP.

Replying to the Secretary of the Appila Branch of the Agricultural Bureau, who asked for a reliable cure for roup in fowls, the Government Poultry Expert (Mr. C. F. Anderson) says:—"Remove the yellowish colored lumps by scraping away with a small piece of stick sharpened at one end. When the lumps have been removed, apply a little powdered bluestone to the affected parts. No relief will be obtained, however, until the lumps are removed. This disease is infectious, and all affected birds should be isolated. The roosting quarters should be cleaned up and sprayed with a 10 per cent. kerosene emulsion; also give a few drops of kerosene in the drinking water—just sufficient to leave a light film on top of the water.

CUTWORMS EATING LETTUCE.

Asking for the best means to exterminate small worms which are eating lettuce plants, the Secretary of the Wasleys Branch has been advised by the Chief Horticultural Instructor (Mr. G. Quinn) that if the pests are true cutworms—caterpillars which hide in the soil during daylight and come out at night and eat the plants—the remedy is a poisoned bran mash made by mixing in a dry condition 1oz. of arsenate of lead powder, or of paris green, in 3lbs. of bran; then dissolve several ounces of sugar or molasses in hot water and make this mixture of poison and bran into a thick mash. This mash is sown in small lumps on the ground around the plants. As this mash is poisonous to poultry or animals which might pick up the lumps, judgment is necessary in using it.

THE GREEN MANURING OF ORCHARDS AND A NEW GRASS FOR THAT PURPOSE.

[By EDGAR W. PRITCHARD, Dip.Econ., Agricultural Botanist.]

It is now well known that by continual cropping, the richest soil, as well as the poorest, will gradually become exhausted. In South Australia the first plant food to give out has been phosphates. This has been remedied by adding to the soil various forms of mineral phosphates, or bonedust. But there is ample evidence that another ingredient is now rapidly becoming exhausted. This is organic matter or humus. All virgin soils contain a certain amount of it, due to rotting vegetation, but this supply soon becomes used up by cultivation. For cultivation loosens the soil, and allows more air to circulate through it. The oxygen of the air then acts on the organic matter, and by the aid of the soil bacteria causes it to decay much more quickly, converting it finally into water, carbonic acid gas, and nitrates. This process, of course, greatly increases the fertility of the soil for the time being; but if the organic matter is not replaced, it becomes finally less productive than if not cultivated at all.

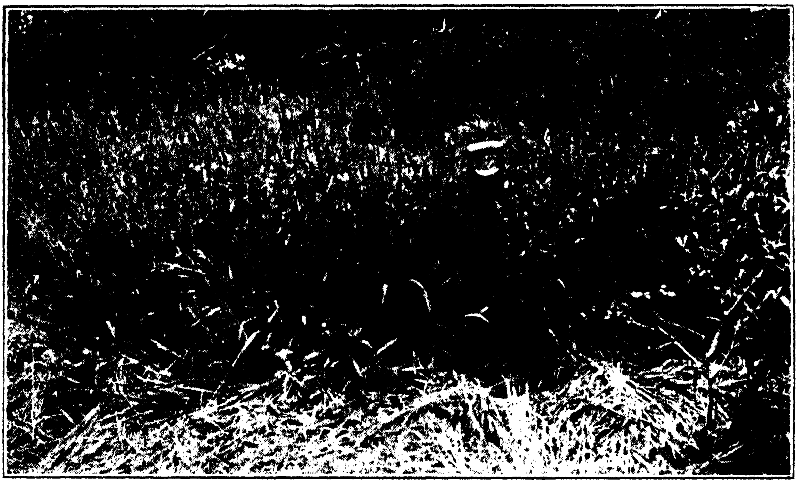

Fig. 1.—Purple Oat Grass, showing Dense Growth.

On farms where the crop rotation contains one year of pasture, or where a fair amount of stubble is ploughed in, the organic content of the soil may be maintained. In orchards, on the other hand, where clean cultivation throughout every summer is necessary, the humus content is apt to get very low, unless some special means is taken to renew it. This is sometimes done by means of stable manure, but that is not often practicable. So almost every orchardist has to rely on the ploughing in of green crops.

Now there are many ways in which a large content of humus is useful in orchard soils.

(1) It helps to hold the soil together in winter.
(2) It prevents it from drifting in summer.
(3) It makes the soil loose and, if heavy, easy to work.
(4) It helps it to hold more moisture, if light.
(5) It retains plant foods, and prevents them being washed out of the soil.
(6) It is necessary for the action of the soil bacteria in fixing the nitrogen of the air, and thus making it available as a plant food.

Further, a cover crop grown in the winter is the best means of holding the soil together, thus preventing washing in districts of heavy rainfall. And yet with all these advantages, green manuring is little practised in South Australian orchards, excepting on the Murray. What is the reason?

I have to thank the Horticultural Instructors for the following information on this point.

The first reason is the difficulty in getting the ploughing done and the crop put in in the autumn, before the heavy winter rains begin. And the second is that, in the hills district especially, the crop cannot be got sufficiently forward to plough in during the spring. This must be done by the end of August or the beginning of September, or there will not be sufficient moisture in the soil to cause the green stuff to rot./ In that case it will simply dry, and so keep the soil too loose and open throughout the summer, and thus dried out to a considerable depth. At the Blackwood Experiment Orchard, I am informed, these difficulties have been largely overcome by taking special care to get the crop in early, so that in normal years, at least, a fair growth of peas is obtained in time for ploughing in. But apparently orchardists generally are not prepared to take these special precautions. I think another reason why green manuring is not more used is, as shown by American experiments, that apple orchards on good soil may not show the effect of the gradual loss of humus till the trees are up to twenty years of age. When that point is reached, however, it takes many years to build up the fertility again, and restore the yields by means of green crops.

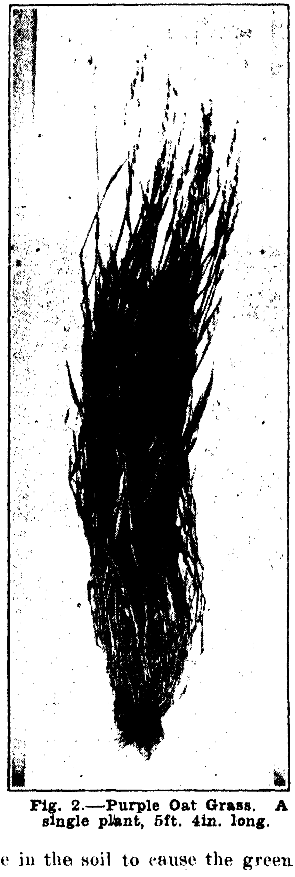

Fig. 2.—Purple Oat Grass. A single plant, 5ft. 4in. long.

Now the crop usually tried, and to which these difficulties specially apply, is peas. So the problem seems to be to get some substitute by means of which these difficulties can be overcome. I believe we have such a substitute in Purple Oat Grass (*Ehrharta longiflora*), an introduced annual from South Africa.

Of the three illustrations, Fig. I. shows the dense growth, most of the stems leaning over more or less; Fig. II., a single plant 5ft. 4in. from the root to the end of the flower heads; while Fig. III. shows two single heads, about half the natural size, much like oats in appearance, only smaller, and with a purple spot at the base of each flower. These photographs were taken in the spring of 1931.

This grass is very common in the suburbs of Adelaide, usually growing in gardens and along the fences in the streets. It is also found in many places in the Mount Lofty Ranges. Pastures do not seem to suit it, probably because grazing animals, being very fond of it, bite off the seed heads, which are borne high up on the stem. Thus it does not get a chance to reproduce itself. Where protected it seeds prolifically, and should be quite easy to reap, in much the same way as oats. Seed gathered from the crop illustrated gave the following results on germination:—

	Per cent. Germination.
Seed dry and ready to fall	52
Seed ripe, but still green	44

The plant is very hardy, growing well even on poor, sandy soil with a little phosphatic manure. Where growing thickly, it soon kills out most other herbaceous plants. Soursobs it will exterminate in two or three years, if encouraged by a little fertiliser, and the same probably applies to Sorrel. It stools well as shown in Fig. II., and forms a dense mass of growth as shown in Fig. I., giving a large amount of green matter. The piece of ground in Fig. I. was self sown, and grew nothing but a dense mass of soursobs two years previously.

And last, but not least, it shoots very early and ripens in plenty of time for ploughing in in the spring. This year (1932) it was 2ft. high, and beginning to flower in the middle of July, which allows considerable latitude for the earliness of the season.

Comparing it with peas, while it would return much more humus to the soil on account of the heavier crop of green stuff, it probably has not the power of abstracting nitrogen from the air as peas have, and would, therefore, only return what it took out of the soil. On this point, however, it has long been known that South Australian soils do not need nitrogenous fertilisers for most crops. This has been shown to be due to the action of the soil bacteria on the decaying humus. During the hot summer months, if the air is enabled to penetrate the soil through a loose surface mulch, they convert large amounts of atmospheric nitrogen into substances which can be used as plant foods. In experiments recently carried out at the Waite Institute, available nitrogen equal to 4cwts. of sulphate of ammonia per acre was produced in fallowed land each year. This should surely be sufficient for the requirements of most orchards, excepting citrus.

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But it must be remembered that, for this process to go on, there must be a sufficient supply of humus. I understand that Sulphate of Ammonia has lately given payable results in experiments in South Australian orchards. But, in such cases, excepting, of course, with citrus trees, I think it will be found that the soil is deficient in humus, and, therefore, unable to fix atmospheric nitrogen. I am informed that in one such experiment the land has not had any green crops or stable manure ploughed in since it was first planted fifteen years ago.

It seems very probable then, that with phosphatic manures (and potash in deep, sandy soils) applied to a non-leguminous cover crop, no more fertilisers would be required for most South Australian orchards, excepting citrus. For citrus orchards this treatment would probably have to be supplemented with an extra dose of nitrogen, as sulphate of ammonia.

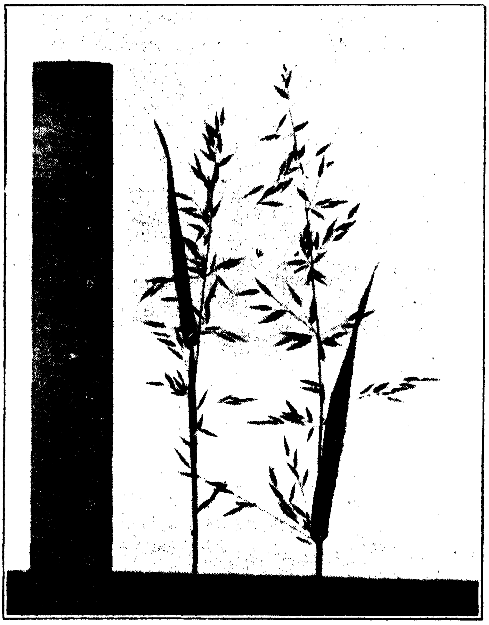

Fig. 3.—Purple Oat Grass. Two Flower Heads.

It appears, then, all things considered, that Purple Oat Grass would fill the bill as a green manure crop for South Australian orchards. Cultivation is easy. The seed would merely need to be drilled or broadcast and harrowed into the soil mulch early in the autumn, while it is still dry, thus ensuring an early start. It would then be ready for ploughing in in the early spring.

Unfortunately, there is not yet a supply of seed on the market, but we have a small quantity on hand in the Department, from which small samples can be distributed to orchardists, who can quickly increase it for themselves, while if there is any considerable demand a regular supply will, no doubt, soon be forthcoming from the seedsmen. Applications for seed should be directed to the Department of Agriculture, Horticultural Branch, Exhibition Building, Adelaide.

Finally, Purple Oat Grass should be worth trying as a hay or ensilage crop on land which is smothered with weeds. And it would surely give good results on pastures, if they could be managed so as to give it a chance to mature and drop its seed each year. The seed falls as soon as it is ripe, so it may be quite practicable. These two further uses are, however, matters for experiment.

LOWER NORTH PRUNING COMPETITIONS.

In the competitions for the Parsons Cup, which has been donated by Mr. W. Langdon Parsons for the competitor who gains the highest aggregate of points over three years ending in 1933 in the Lower North Local Pruning Competitions for both fruit trees and vines, the Secretary (Mr. J. S. Hammat) reports that Mr. B. Fromm (Lone Pine) was the successful competitor in 1931 and Mr. F. W. Boehm (Light's Pass) in 1932.

The following table shows the points gained by the competitors who secured more than 1,000 points during the past two years:—

Competitor.	Trees.	Vines.	Total.	Trees.	Vines.	Total.	Grand Total for Two Years.
F. W. Boehm ..	358	186	544	371	185½	556½	1,100½
B. Fromm	369	187	556	362	181	543	1,099
H. Linton	369	175	544	371	183	554	1,098
C. A. Hoffman .	358	186	544	361	185½	546½	1,090½
A. Andriske . ..	344	192½	536½	366	188	554	1,090½
A. S. Burgess ..	363	181	544	357	189	546	1,090
G. Boehm	361	186	547	356	187	543	1,090
A. J. Chapman .	352	193½	545½	355	180	535	1,080½
Wilf. Smith . ..	364	174	538	363	174½	537½	1,075½
F. H. Schulz ..	362	192	554	348	168	516	1,070
H. Wilksch	356	189	545	345	177	522	1,067
H. Kappler . ..	362	187	549	337	180½	517½	1,066½
L. Koop	348	184	532	343	180½	523½	1,055½
S. Turnbull . ..	336	186	522	360	171	531	1,053
V. M. Duke . ..	330	174	504	365	177	542	1,046
C. S. Wyman ..	337	181	518	351	176	527	1,045
J. Brysky	348	187	535	341	170	511	1,046
O. Burford . ..	348	170	518	342	180	522	1,040
A. Milway	348	181½	529½	350	159½	509½	1,039
E. W. Burgess .	352	171	523	360	156	516	1,039
W. B. Koop ..	343	181½	524½	347	166½	513½	1,038
W. Ahrens	351	171	522	346	169½	515½	1,037½
H. Hammerling .	326	177	503	355	178	533	1,036
A. Smith	353	178	531	325	180	505	1,036
C. G. Fromm ..	325	181	506	354	175	529	1,035
G. Burgess	347	168	515	362	157	519	1,034
F. L. Burgess .	350	170	520	361	146	507	1,027
A. Hage	316	184	500	334	190½	524½	1,024½
E. H. Schulz ..	325	186	511	329	180½	509½	1,020½

The average production of dairy cows in Great Britain is 574 gallons of milk a year; in Denmark, 571 gallons; Germany, 520; Norway, 445; Australia, 290 gallons.

THIS SHOWS THE URGENT NECESSITY FOR IMPROVING METHODS OF FEEDING IN AUSTRALIA WITHOUT DELAY.

USE
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PAPERS READ AT CONFERENCES.

THE BIRD PEST AND HOW IT AFFECTS FRUIT PRODUCTION.

[By Mr. F. W. ALLISON, Strathalbyn.]

(*Southern Conference, Belvidere, August 18th.*)

The subject of this paper is one which does not cause the general farmer very much concern, but when one considers the total amount of fruit grown and exported, and how it re-acts on the whole State, it is a subject that must command attention.

With each succeeding year, so mounts up the increase of birds and the cost of protecting the fruit. During the last six years I have been able to observe many of the difficulties under which the fruitgrower is laboring to protect himself against the ravages of the many kinds of fruit-eating birds. More especially is this noticeable on the smaller holdings which produce from 1 to 4 tons of currants, with stone and pip fruit proportionately.

The birds are great workers, working from daylight to dark. This means constant and tireless attention, which is an enormous tax on the grower of time, money, and patience. At the present time in the southern districts, no concentrated efforts are being carried out to combat this pest, it being purely on an individual scale, and further, while growers remain passive, nothing in the way of assistance will ever be accomplished.

By observation, it has been found that birds, in the following order, are those that are doing the damage. The starling, sparrow, silver-eye, parrot, and minah. Of these the starling is most destructive, and these birds will soon do extensive damage to the fruit if left alone for only a short time.

One can only conjecture at the amount of fruit taken when these birds swoop down on vines in flocks of 500 or 1,000 or more, even if they only take two or three berries each raid, this will soon mount up to large proportions, for this continues each day, from the time the fruit begins to color until it is picked. A vigneron of Langhorne's Creek estimates his loss at £50—for protecting and keeping the birds off—another at £40, while a very conservative figure for protection and loss of fruit in that locality is placed at £500. And what applies here also applies more or less to the whole State where fruit and almonds are grown.

Various means are used to combat the pest; mechanical devices of all shapes and designs have been tried, but with very little success, for the birds will very soon get so used to them that they will sit on or around them. The only successful method must come through the use of manual labor and by the continual use of the whip, the gun, or a kerosene tin. Yet all these methods are of a very temporary nature.

Something definite and of a concenterated organised nature must be done to be of any real value, and must be simultaneously carried out. Good results in isolated cases have been accomplished by scattering poisoned currants under the vines and trees immediately after the fruit has been picked; or by the formation of clubs to collect heads and eggs at so much per hundred on somewhat similar lines to those formed in parts of Victoria, and that the Government be approached to assist the fruitgrower on an equal basis.

Another point is the wholesale manner in which starlings and sparrows scatter the seed of boxthorn and other noxious weeds. Still further, that the class of birds dealt with in this paper are largely responsible for pushing out the smaller non-fruit eating kinds, such as wagtails, larks, wrens, swallows, and a number of other smaller ones. After giving this question serious consideration I am convinced that the caterpillars and grubs these various birds devour do not compensate for the amount of damage and loss of capital incurred by the fruitgrowers of the State, and that the time has arrived when concentrated effort must be organised to combat this pest.

THE DAIRY COW.

[By Mr. W. Robinson, Currency Creek.]

(*Southern Conference, Belvidere, August 18th.*)

Many farmers who have been chiefly occupied in the production of wheat have, owing to the falling prices in wheat, turned their attention to dairying, and have established fodder plots and installed milking machines on their premises. The chief reason is that cream invariably returns, regularly, ''ready cash,'' which in existing times is most essential, while wheat returns, owing to fluctuations, are so uncertain.

With all the natural possibilities and suitable land available in this district—which carries an abundance of natural grasses—there is a splendid opening for an enthusiastic farmer to establish a good dairy herd, commencing on a small scale with good sound stock, and with that end in view the following points may prove helpful to the prospective farmer in selecting a good type of cow as a nucleus for his herd.

Production Factors and Essential Characteristics of the Ideal Dairy Cow.

To be successful in dairying, a man must have many attributes, but above all he must be a good judge of the dairy cow. No one can hope to tell from the appearance of the cow how much butterfat she will yield. This has been demonstrated repeatedly ever since herd testing began. The only really reliable guides are the scales and the Babcock milk tester. Unfortunately, however, cows cannot always be purchased on their test record, and in purchasing new blood or building up a herd the dairyman who has a sound knowledge of the essential points of a dairy cow will make fewer mistakes than the man who has not the knowledge.

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It must be borne in mind that to all intents and purposes the dairy cow is a "machine" for the reproduction of her kind, and for the production of milk and butterfat. Her commercial value depends on the quantity and quality of her production, and her ability to maintain her productiveness over extended periods. If the machine is to function properly and profitably certain characteristics are essential. Among these the most important are:—

1. Constitution;
2. Capacity;
3. Nervous Temperament;
4. Blood Circulation; and
5. Ability.

Each of these characteristics enumerated is so vitally important that it is difficult, if not impossible, to say which is most essential. Unless they arq all in proper development, profitable production cannot be expected. These essential characteristics are not confined to any particular breed of dairy cow more than another. The choice of a particular breed is only of secondary consideration and a matter of personal preference of the farmer. The important thing to ascertain is that the cows that are selected have the above characteristics.

If she is to produce a satisfactory quantity and quality of milk a cow must have capacity, and if she is to continue the good work throughout her lifetime she must have a vigorous constitution and abundant vitality.

Constitution in a cow is determined by several factors, foremost of which is ample breathing capacity. Oxygen is essential for the purification of the blood, and if the cow is to receive the required amount of air a large breathing capacity is required. This is demonstrated by a good lung capacity and large, open nostrils. If the nostrils are small and not well opened the amount of oxygen which reaches the blood through the lungs is restricted, and constitutional vigor is underdeveloped. Small nostrils are a definite indication of low breathing capacity.

The vitality of the animal is determined partly by the size and capacity of the chest, within which are located the heart and lungs. The dairy cow should be deep in proportion to her size, from the top of the shoulder to the base of the chest. To give the vital organs ample room for development and action, the foreribs should be well sprung, but not broadened out into the wide spread of the beef animal. Another indication of vitality is found in her eyes. Bright, clear, and prominent eyes are evidence of vigor, while the cow with dull, sunken eyes is usually the animal to be avoided.

By capacity is meant the total amount of food she can consume and digest, while her profitable capacity lies in the amount of food she can assimilate above the quantity required for her bodily maintenance. Usually cows which are big feeders are more profitable than those of a smaller capacity, for they are less dainty in their tastes, and will consume a greater proportion of the more plentiful and coarser roughage. Cows with limited capacity are more likely to go off their feed and get out of condition, with the result that the milk flow also falls away. A cow must be fed heavily if she in continually in milk.

A large mouth is a matter of prime importance. This feature indicates a good feeder, and the best evidence of capacity is a large barrel. This is accompanied generally by length of body with broad, deep, and well-sprung ribs, and a large girth measurement in proportion to the size of the animal.

Breadth and depth of body are more desirable than length. Lengthy bodies within the well-sprung ribs indicate generally a poor feeder, a poor producer, and a poor mother.

The condition of the hair and skin must next be taken into consideration. The cow with a hide that is soft and pliable, easily lifted from the body, and covered with a soft, silky coat of hair is in good condition, and has her digestive apparatus in proper working order. Dull eyes, harsh skin, and wiry coat, are indications of digestive troubles.

So far as the nervous temperament is concerned, a dairy cow should have a strongly developed nervous system to enable her to carry on with milk production and her offspring. The term "lymphatic temperament" is essential for beef cattle. These two temperaments are contrasts. The "lymphatic" enables the animal to lay on beef, whilst the nervous temperament enables the cow to lay on milk, *i.e.*, they may eat the same food but make different uses of it.

Nervous temperament is indicated by a long, broad forehead with plenty of space between the eyes. Other indications are prominent, large, and intelligent eyes. Freedom from beefiness, absence of surplus body fat, and extreme angularity of form, with prominent hip bones and ribs, are also evidence of the desired nervous temperament.

Blood circulation is next important. Unless the cow has a good circulatory system she cannot derive the maximum benefit from the food consumed. The milk veins which extend forward from the udder are actually blood veins, and their size, length, and form serve to determine the quantity of blood which flows through the udder. These veins terminate in the so-called milk wells which are the openings in the abdominal wall where the veins re-enter the body. Usually both the milk veins and the milk wells are large in heavy-producing cows. With large productions the veins may be also very crooked and have several branches with as many milk wells. Therefore, the development of the system of milk veins is one of the best indications of milk production capacity of the cow.

The fifth characteristic—the ability to produce—is not merely the capacity of the cow for milk production. She may have the capacity and yet lack the ability to produce up to that capacity. By capacity is meant that the cow can consume, digest, and make use of or assimilate large quantities of feed, while ability means that she can turn the nutriment elements of that food into milk and butterfat. It is, perhaps, the most important of all the characetrisics, for without it the others are of little avail.

The size, form, and texture of the udder are practically the only indications or outward manifestations of her ability. The udder should be long and broad, attached high behind and extend well forward. Its breadth should fill the space between the thighs, and it should have a nearly level bottom line parallel with the underline of the body. A deep, pendulous udder is not desirable. Quality and texture are highly important in the udder.

There is evidence of both when the vessel is soft and pliable, capable of great expansion when full, and equally great contraction when empty, and covered with a coat of silky hair. It should be well distended and smooth before milking, and should gradually collapse in numerous soft folds when the milk is withdrawn.

Though the foregoing are not infallible rules, a knoweldge of the essentials and characteristics outlined above are necessary for the dairy farmer who hopes to build up a first class herd. Used sensibly and in conjunction with testing, that knowledge should provide both profit and pleasure to the owner, for there are few occupations more interesting than the breeding of high class livestock, and particularly dairy cows.

THE DAIRYING INDUSTRY.

[By Mr. A. G. Ifould, Port Elliot.]

(*Southern Branches Conference, Belvidere, August 18th, 1932.*)

At the present time the dairying industry is playing a most important part in solving many problems regarding the man on the land, and it behoves every producer to assist the State in one of the worst financial depressions ever experienced, and the cow is going to help materially to improve matters. The foundation or building up the herd plays the most important part in successful dairying. First it is necessary to form the cow's udder. Judicious milking: milking the back quarters always first, throwing the milk into the front quarters, helping to balance the udder. This is the most important part of the dairying industry. It does not matter how well the cows are bred or their high testing ability, they can be utterly ruined in the first milking causing disabilities in the dstribution of the milk flow. Every dairyman knows that the cow's udder is a network of machinery, and that machine requires proper management and consistent milking, which can only be done by a life-long experience and careful manipulation. Kind treatment of the animals is essential. There are many obstacles to overcome, such as ailments, &c., one of the worst being mammitis, which by careful drying off and watching the symptoms, can be overcome, as in other troubles prevention is better than cure.

''Cleanliness is next to Godliness,'' and all produce connected with milk, cream, etc., should be delivered to factories in the most hygienic condition, then it will be possible to compete with the markets of the world.

POULTRY ON THE FARM.

[By Mr. C. Fairmann, Hartley.]

(*Southern Branches Conference, Belvidere, August 18th, 1932.*)

At the present time many farmers are keenly alert for any opportunity to introduce into their holdings new or extra sidelines. For those favorably inclined towards poultry, the following points may prove helpful in the selection, care, rearing, and feeding of their stock. As it would perhaps take quite a considerable time to get broody hens suitable for raising chickens, the purchasing of the foundation stock from a reliable poultry farm with a reputation for good birds is suggested.

The foremost consideration should be the type of bird most suitable to the locality and the particular ''fancy'' of the farmer. There are various types on the market, but the White Leghorn and Black Orpington appear to be the most popular breeds. Other breeds, such as Minorca, Plymouth Rock, Buff Orpington, Wyandotte, and Rhode Island Red also find favor with some breeders, but the two first-named are undoubtedly the most popular for egg production. The Black Orpington is perhaps the better of these two, owing to its size, for it may be used as a table bird if it fails in its mission of egg production.

In most cases it will prove more profitable to buy chickens and rear them on the farm, taking care to study the correct methods of feeding and housing the chickens.

Chicks need no feeding for the first 48 hours to 60 hours after hatching, as part of the yolk—approximately 1 cubic centimetre—goes into the stomach on hatching. When commencing the feeding, give crushed wheat, chaffed green, and water, plain bran or pollard, Mashes should not be given to young chicks; they are liable to cause bowel trouble, although buttermilk may be fed to advantage. Dust chicks freely with an insecticide to kill off any parasite while they are in the brooders.

Housing.

Having thus established a foundation for pure-bred stock, the next in importance is the housing of the young birds. Cleanliness and neatness are essential. Endeavor to build a house on modern lines. Housing prevents fowls from roving amongst haystacks, stables, and gardens, and they do much better when housed correctly. Make the conditions as roomy and as accessible as possible. The house should be built in the direction that will eliminate draughts and should not face the quarter from which the rough weather prevails. For this purpose a house facing the east or north-east is preferable, because birds appreciate warmth and sunlight. The back and sides can be constructed of galvanised iron and the front of netting and ordinary window glass or a glass fabric. Avoid wooden buildings if possible; these become harbors for parasites.

Ventilation is important. Plenty of fresh drinking water is of primary importance, and the best way of doing this is to have a dripping tap somewhere in or near the house where the bird can get fresh water at will. Concrete or bitumen makes the best flooring; it does not readily become damp. The house should be thoroughly cleaned at least once a week.

Litters—not mouldy straw or hay—should be spread on the floor for scratching purposes, and the grain when fed to the birds should be scattered among this litter, so that the fowl has to scratch for it, giving it extra exercise, which is necessary for the housed bird.

Perches, under which dropping boards are placed, should be 18in. to 2ft. high, and of convenient shape for the birds' feet to hold on comfortably. Wrongly constructed perches lead to deformities. Nests can very well be made of kerosene or petrol tins cut open on the end and about half filled with shell grit, with perhaps a few pieces of charcoal and finely cracked china added. Do not on any account use straw for nests.

FEEDING.

Feeding of the stock is another important factor in successful poultry-keeping. Remember that the hen is a laying machine and cannot continue to work without energy. Food creates energy, therefore birds should be fed correctly to get the eggs. It takes as much to feed one fowl as it does to feed another, hence the necessity to keep only the best strain of birds. Use only the best of foods and avoid the feeding of spices; they are useless in promoting egg production.

For egg production it is necessary to have large-framed birds; these invariably lay large eggs. For the purpose of building frame and shell in the bird, lime has been proved of considerable value. It is a good plan to place lime in the drinking water. In the absence of lime, powdered superphosphate or ground and burnt bones may be used to good effect. In any case, 1 saltspoonful of the above should be put into the birds' mash daily; it builds frame for the bird and adds lime for the shells in the laying strains.

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Making a Mash.—The quantities taken are for one bird daily:—½oz. bran, 1oz. pollard, 1½ozs. chaffed greenfeed. Use 1½ozs. greenfeed for winter feeding, and 3ozs. for summer feeding. Lucerne, rape, or mustard make excellent greenfeed for the birds. Add to this wash about 10 per cent. of the dry constituents by weight of meat meal or rabbits or other meat.

The water used for mixing could be the drainings of waste household scraps boiled. In addition to the mash, feed grain as follows:—2ozs. daily for layers and 1½ozs. for non-layers during the day. Mashes should be fed either night or morning as is convenient, although night feeding is not as preferable as morning. If mash is fed in the morning, grain could be given to advantage at night.

The seasonal effects of birds must be closely watched, because they go into a moult during autumn. It is advisable, therefore, to get chickens six months old in March. March hatched chicks come in in September and lay while the others are moulting.

The egg market at present is not very encouraging for inferior eggs, but we should endeavor to compete with the overseas markets, for which prices are favorable. At present we are exporting something like 100,000 cases per year overseas, and there is no reason why we should not be exporting half a million cases. We should see that the standard and quality of the egg sent overseas is good and of standard weight, which should be from 1¾ozs. to 2¼ozs. It should be the aim of every poultrykeeper to see that he keeps a class of bird that lays eggs of 2ozs. or more in weight, and 300 eggs under 2ozs. are not as good as 200 over 2ozs. It will readily be seen that only good quality stock should be kept, and any bird that does not lay large-sized eggs and about 220 per year should not be used for breeding purposes.

A hen is commercially useful up to 3 years, and after that should be culled from the flock. The hen is, in reality, a laying machine, and as with all machinery, cannot go on working for ever, so it will become necessary for the keepers to maintain the standard of their strain by culling out old birds periodically.

When culling, it is advisable to cut out any deformed, sick, or diseased birds, for one fowl may cause the destruction of the whole flock through diseases, &c. As the flock diminishes through periodic culling, it will be necessary to breed more chicks to keep up the desired number of hens, and a few hints here on the selection of eggs for hatching may prove beneficial to the beginner.

All eggs selected for hatching purposes should be from 2ozs. to 2¼ozs. in weight; anything over that weight is not recommended. Select smooth-shelled eggs, free from any wrinkles, and avoid any abnormal eggs. Two shapes that are considered good are the long shape of the White Leghorn and the round shape of the Black Orphington. Avoid misshapen eggs and also those with rings around them. If they are dirty before setting, wiping them with a damp cloth will not be harmful. If setting under a broody hen, see that the hen is freely dusted with an insecticide to kill off any parasites, such as mites, lice, &c.

The eggs should be set on slightly damp ground, because they need warmth and moisture to germinate efficiently. Do not, on any account, use straw; it forms a home for the breeding of parasites.

If an incubator is used, use a reliable make and attend to the directions given by the makers. After the experience gained in laying the foundation of a good laying strain of birds, poultry-keeping should present very few difficulties and prove interesting and profitable to the farmer who takes it up as a sideline.

THE PROBLEM OF MAKING FARMING PAY IN THE MALLEE AREAS.

[By H. SANDERS, Yurgo.]

(*Murray Lands, Karoonda, August 2nd,* 1932.)

Having been in this district just 21 years, the writer can claim to know something of the subject of this paper. The following remarks or criticisms are not made in any carping or disgruntled spirit, but with a desire to assist, if possible, some of the farmers in the Mallee who have not had so much experience nor the opportunities for learning.

It seems likely that for some years at least primary producers cannot expect to receive more than comparatively low prices for their products. The first job is to set about reducing costs of production in every possible way, and the man that can balance his budget each year will be in the best position to take advantage of any improvement when it comes.

There are several ways in which costs can be reduced: improved methods of working fallows and seeding; using the most suitable varieties of wheat and oats; careful study of the most suitable rotation for the district; using the most economical quantity of manure and the right sort of manure; the most suitable sidelines; and, finally, to market the farm products in such a way that the best return will be obtained.

IMPROVED METHODS OF WORKING FALLOWS.

This question is worthy of a paper to itself. Travelling about the district, one often notices that the farm operations are being conducted in anything but a satisfactory manner. Bad farming undoubtedly injures the credit of the district and all those that live in it, and where such practices are continued until they bring about the ruin of the farmers, who, in many cases, have received Government assistance, all have to contribute indirectly through taxation. Waste, whether it be of time, energy, or money, has to be paid for, and there is no dodging it. One often sees a farmer using an unsuitable implement, or one in bad order or too large for the power available. This results in a poor job being made of the first ploughing. It is impossible to make a good fallow after a poor start, without a lot of unnecessary work. Deep ploughing is not necessary in this district, but it must be deep enough to insure that all the ground is moved, and, if possible, turned right over and afterwards worked when necessary. The same applies at seeding; see that each implement is in a condition to do the work for which it is intended.

USING THE MOST SUITABLE VARIETIES.

There are many varieties of wheat and oats which have been well tested, and the wheat that will be best for one farm may not be so suitable for another. However, there are several varieties of early and mid-season wheats which stand out from others, and there is ample scope for individual choice. No one wheat will come out on top every year, and it is always advisable to sow at least four varieties and escape as much as possible the ravages of droughts, frosts, rust, takeall, and other handicaps. Whatever varieties are selected, see that they are free from barley or oats, properly graded to eliminate cracked or shrivelled grains and efficiently pickled, and a better crop will result, with a corresponding decrease in the cost of producing.

MOST SUITABLE ROTATION.

From the Crop Competitions it appears that a four-course rotation is the most favored in this district. Bare fallow, wheat, oats—either for grazing or grain—pasture, appears the best rotation at present, but as the country becomes older it may find it advisable to alter the foregoing somewhat on the following lines:—fallow, wheat, oats sown with lucerne, pasture, pasture, pasture. I have sown over 100 acres with lucerne this year, and intend to continue each year so far as circumstances will permit.

FERTILISER DRESSINGS.

This is an important question, and in the light of experiments conducted by the Department of Agriculture on my own farm over a period of nine years of varying seasons, 2cwts. per acre of 36 per cent. superphosphate proved the best proposition. It has given the best yields, and the residual effects on the pasture in after years is most marked. I am aware that it takes courage as well as finance to use 2cwts. of manure, and it is realised that no quantity of manure will grow a crop if the land is not suitably worked to receive it; but my advice is, if the fallow is good put the maximum amount of manure into it. Results of experiments over the last two years with sulphate of ammonia on stubble land have been astonishing. Last season the plot which was dressed with 1cwt. 45 per cent. super. yielded 8cwts. 103lbs. of hay; 1cwt. super., ½cwt. sulphate of ammonia, 14cwts. 30lbs.; 1cwt. super., 1cwt. sulphate of ammonia, 21cwts. 88lbs. per acre. As this manure is expensive, one hesitates to advocate its general use, but wheat sown on stubble this year promises to show even bigger differences than last year's.

SUITABLE SIDELINES.

Without a doubt, sheep come first under this heading, and I am firmly convinced that, other things being equal, the man that runs sheep will grow at least a bag to the acre more than the man who does not. Here is one instance where the protective tariffs hit the producers very hard: Australian or New South Wales wire costs £18 per ton, and if it were not for the embargo English wire landed at Port Adelaide could be bought for £11 and Continental wire for less.

Much prominence has been given to dairy cows on the farm, and it is agreed that where a man has suitable labor and feed, they have their advantages, but in many cases they do more harm than good. Men who have not the time, the fencing, or the feed, are running a few cows—often of a poor type—which are a constant worry by getting into the crops. They are taking up the time of the farmer which should be employed in working the land and producing a payable crop, but for the sake of the ready cash the farm work is neglected, and at harvest time the results are poor.

POULTRY AS A PAYABLE SIDELINE.

[By S. EYLES, Clarendon.]

(*Hills Conference, Clarendon, August 25th,* 1932.)

This paper is my opinion of what one should do to make the most out of poultry as a sideline. There are three main points to consider, first, strain and breed; second, housing; and third, feeding.

First procure a good strain that will lay a large egg. Buy settings or chicks from a reputable breeder. Generally speaking, the heavy breeds such as Black Orpingtons lay better than the light breeds in winter and will stand much more rough usage, but eggs can be obtained from strains of White Leghorns that will lay all the year round if properly cared for. The average farm fowl is usually a mixture of breeds and lays eggs when they are cheap—they put in about four months of the year going on and off broody—and in my opinion are not worth their keep. I had about 300 birds of a well-known strain and collected 1,811 eggs in four months from April to July; I cleared this lot out and purchased the strain I have now, and in the same period I collected 3,870 eggs from about 100 birds. More than twice as many eggs at about a third the cost of feed.

HOUSING.

The birds will not lay in the winter unless they are kept warm, dry, and busy. The best thing to do is to provide a shed, where the birds can be closed in. If it is proposed to start with 100 layers a shed that will accommodate 150 will be needed, because 50 old birds should be culled out each year. One compartment each for the second year hens, one for first year hens, and one for pullets coming on to lay. A shed 30ft. long by 16ft. deep, divided into three, will suffice because each bird requires 3ft. super floor space. The second year hens should be sold when they go off laying in the autumn. There is usually enough wire netting around hay stacks, vegetable gardens and flower gardens to make a yard to keep the fowls in when they are let out of the house in fine weather. This should be done, because, if allowed to roam anywhere they do a lot of damage on a farm and soil the trollies, implements, &c., by roosting on them. If the birds are kept from roaming the eggs will always be laid where they can be gathered without a ladder. Have a yard about a chain square, with the fowl house in the centre. If the yard is divided into smaller yards, these can be cropped with barley, rape, kale, mustard, &c. A patch of lucerne is the best for summer feed. It will pay to feed as much greenfeed as the birds will eat, this will save bran and pollard, and will produce more eggs and better colored yolks.

The house should face north or north-east, but do not face a gully wind. The yards should have a slope to facilitate drainage. Provide a cement floor in the house, if not all over at least under the perches.

Perches should be fixed in the most sheltered place, allowing 9in. perch room for each bird, and have all the perches on one level; about 18in. from the floor. The best perch is made as follows:—Drive a piece of water pipe 30in. to 36in. long into the ground until there is about 17in. left above ground; one at each end of each perch; get a hardwood perch, about 2½in. to 3in. wide by 1¼in. to 1½in. thick, bore ⅜in. holes at each end about 6in. from the end, to correspond with the holes in the pipe, drive a 6in. x ⅜in. bolt through the hole in the perch into the pipe. These perches are easily removed to clean out underneath and to oil, which should be done every two weeks during summer to keep down red mite. Nine or 10 nest boxes will be required in each pen. These should be off the ground—kerosene tins make good nests. Make a cut 2½in. up on one end and remove the large piece of end, have a perch in front of the next boxes about 9in. away from them. Have the tins about 18in. above the floor to save floor space. Dry mash hoppers will also be needed. These can be made at home or purchased ready made. They should also be kept off the floor. If the shed is floored with cement or bitumen, provide a dust bath as follows:—Nail two pieces of wood about 9in. wide by 4ft. long to form a right angle, and fix in one corner of the pen, about half fill with sand, road grit, or similar material, and mix in some wood ash, and if you have any flowers of sulphur, about three or four handfuls will be an improvement. Sieve this dirt occasionally and see that the same quantity is maintained. Have a slab or board about 9in. wide in front of perches to keep the scratching litter away from the manure under the perches.

Arrange a place to keep the water tin where the sun will not shine on it. This also is better when placed above the floor level, and provide a tin large enough to hold a full day's supply. See that the house is high enough to permit of walking without

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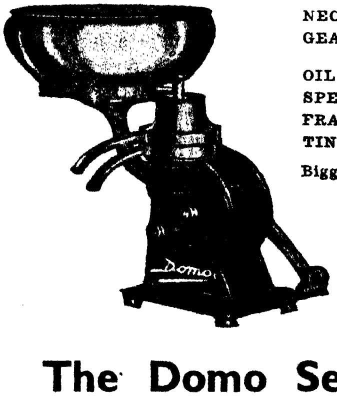

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stooping. Pea straw about 6in. deep makes a good scratching litter; old, dry stable manure is also good. Only a very small quantity of scratching litter is needed in the hot months because then the birds do not want too much exercise. Have ¾in. wire netting on any openings in fowl house to keep out sparrows.

Arrange a trap door to each pen about 6in. above the floor level. The floor of the house should be about 6in. higher than the outside ground level to prevent flooding. Make the house as nearly draught proof as possible, with ventilation at the top.

FEEDING.

The easiest and most convenient way to feed fowls, whether they are shut in or not, is the dry mash system. Dry mash costs no more and the egg yield is very little below the wet mash in the various competitions. Another point is that it does not sour like the wet mash if not eaten up quickly.

The mash I use is as follows:—60lbs. pollard, 30lbs. bran, 10lbs. meat meal, add not more than half a tea cup of table salt to the meat meal before mixing with the pollard and bran. See that there are no lumps of salt, and thoroughly mix all together. This quantity should be enough to last 150 fowls about six days with the addition of 2ozs. of wheat per bird per day, and as much greenfeed as they will eat. When the birds are in full lay add 15 per cent. to 20 per cent. more bran and reduce the meat meal by 3lbs. to the amount of mixture given. In hot weather, the addition of 25 per cent. of lucerne chaff or, failing that, 10 per cent. of lucerne dust, will be appreciated by the birds. Fowls will not gorge themselves on dry mash, they cannot eat a lot until they have moistened it in their mouths as an aid to digestion.

When greenfeed is available give a feed of chaffed material at midday—about one kerosene bucket to 150 fowls—and another feed after they have had wheat at night. If the green feed is not chaffed grow rape, mustard, chou mollier, or cabbage. Give the leaves tied up in bunches and hang them up so the birds can strip them. A fowl will consume about 45lbs. of wheat, 40lbs. of dry mash, and about 20lbs. to 25lbs. of fresh green feed, so that the cost of keep for one hen is approximately 6s. per annum. Wheat at 3s. 6d., pollard 1s. 3d., bran 1s. 2d. per bird, meat meal at 3d. per lb., this does not include cost of greenfeed. Cheap lines of wheat should not be used because they contain a large proportion of rubbish. A fowl has to lay at least 100 eggs each year to pay for its keep.

The average number of eggs laid per hen in South Australia is only 120, and as the commercial man cannot make a living under 170-180 eggs per bird it is evident that the farm yard hen brings down the average. If one obtains a good strain of layers of large eggs and takes the trouble to properly house and feed them it is possible to get an average of 170 to 180 eggs per bird or more if the boarders are culled out.

Two breeds—Orpingtons and Leghorns—are recommended for the man on the land. The Orpingtons will "go broody" and maintain supplies. With two breeding pens they can be kept mated as long as desired. The eggs not wanted for hatching can be used in the house. Select the best pullets and put a colored ring on them, then they can be picked out at any time. If a bird should go off color or "go broody" mark it with a different colored ring, and do not breed from any "broodies" or birds that have been ill. Dispose of these birds when you sell the second year hens. If there are 50 or more good layers it will pay to join an association to get top price for eggs.

If there are birds in the flock that are not earning their keep all the year, cut the losses, save a few to keep the house going, and with the cash from sale of birds it should be possible to purchase good settings of large eggs, not under 2ozs. in weight. To commence, it may be possible to convert a shed not in use. Make a yard and get some greenfeed planted. When a strain that is giving satisfaction has been selected, stick to it and when fresh blood is required go to the same man for it.

Oil the perches often in hot weather with kerosene and old engine oil mixed in equal parts. Look out for internal worms during September and October. The signs are dark tips to comb, with droppings frothy and yellow. If skim milk is on hand the fowls like it when they get used to it, but it should be fed in a vessel that can be cleaned easily.

Keep an account of all eggs laid, and when balancing the profit and loss account do not forget to charge the difference in eggs sold and eggs collected, also any fowls used for the table. There is another item that should be credited to the fowls' account—the manure. About 1½ kerosene buckets will be collected from under the perches of 50 fowls each week. If this is dried and sieved it can be used in the drill for top-dressing grass land. It is a very suitable manure for all vegetabes and worth at least 4d. per bucket.

BENEFITS OF IRRIGATION ON APPLE TREES.

[By R. Morphett, Clarendon.]

(*Hills Conference, Clarendon, August 25th, 1932.*)

My property is only in the early stages so far as irrigation goes, but results have been good. While the orchard was young there was no need for it, but as the trees got older it was impossible to get the fruit to size, even with thinning. It was also found that trees—which in their younger stages carried a crop every year—would only crop alternate years as they grew older.

In the season 1927-28—a good apple year—I had a very heavy crop and was unable to bring them up to size, although I thinned out. I finished the season after packing 200 cases of 2in., with about 700 cases too small for export, which meant that instead of a return of 5s. they realised only 1s. 3d., and a third of them were wasted altogether.

The following season, 1928-29, after such a gruelling, the trees did not produce a case of apples. I then decided to instal an irrigation plant to assist the trees in maturing their buds. The plant was installed in the 1929-30 season, which was a very disappointing apple season throughout the State, and finding that the apples were not filling too well I decided to irrigate. Irrigating was started early in January, 1930, but having heard so many different opinions on the amount of water per tree, I was frightened to give them more than 100 gallons per tree; finding three weeks later that the trees were not responding to the water I watered again, this time giving 200 gallons per tree, this seemed to have some effect, because I was able to pick two-thirds of the crop without further water. The other third of the trees which had a very heavy crop and from which I had picked a third of the crop was again watered about the end of February, giving 200 gallons per tree. I was then able to pick all of the crop for export, with the exception of about 40 cases. As the seasons were still keeping very dry, that yield compared favorably with the previous heavy cropping season, also the trees held the foliage very late and made good growth.

Having watered late that season and having 1¼in. rain soon after picking, I did not water to force the buds, but the following ''off'' season—1930-31—the trees averaged approximately one case to the tree, a vast difference to the previous ''off'' year, when I did not pick a case in the whole orchard.

THINKING AHEAD

The right kind of thinking ahead, of planning for the future, is that which is instantly translated into action, when the thinker, the planner, has decided upon the objective and the means by which it may be obtained.

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As soon as I picked the apples in 1931, the orchard was ploughed and planted with Dun peas with as much super as could be got through the drill. They were about 4ft. high and flowering when ploughed in. As the season advanced the trees blossomed splendidly and a very heavy crop set. A week before Christmas I started to thin out and a week after started to irrigate, this time not taking advice from anyone. I have just finished and averaged 450-500 gallons per tree. Of course, I realise that water alone will not give satisfactory results, but with irrigation it is possible to manure, and this year I have had one of the most successful seasons on record.

MY EXPERIENCE OF FODDERS IN THIS PART OF THE MALLEE.

[By C. L. BRUCE, Nunkeri.]

(*Karoonda Conference, August 2nd,* 1932.)

Having realised in 1912 that this mallee country when first cleared grows very poor feed—mainly Yellow Daisy Bush and Long Rooted Catsear—and that it was essential to plant other grasses, from the commencement in 1912, I have sown the following grasses:—Madrid Brome Grass, Hairy Brome Grass, Barley Grass, Evening Primrose, King Island Melilot, Multi-seeded Millett, Subterranean Clover, Burr Clover, Cluster Clover, Woolly Clover, Haresfoot Clover, Perrennial Rye Grass, and Wimmera Rye Grass. In 1912 I scattered grasses which did well around our suburban garden, afterwards finding them to be Madrid Brome Grass, Hairy Brome Grass, and Barley Grass. Of these, Hairy Brome Grass and Barley Grass did fairly well. But as time went on I realised that I had made a mistake in so doing. Madrid Brome Grass proved a poor doer, very poor feeding value, and the stock only ate it when it was young. Hairy Brome Grass did well, but the stock only ate it when young, it was also poor feed, and the seeds became very troublesome in the mouths of the stock and in the bags of cereal grain. Barley Grass grew well and was a little better feed than the others, but the places where it was first sown in a few years proved the worst patches of the take-all.

EVENING PRIMROSE.

In 1915 a considerable quantity of Evening Primrose was sown. This did very well, grew a lot of feed, and harbored none of the cereal diseases. It proved a fairly good fodder, but as the sheep flock increased they did not allow it to seed in sufficient quantities to grow any quantity of feed.

SUBTERRANEAN CLOVER AND PERENNIAL RYE GRASS.

These were sown in 1922. Perennial Rye Grass did not seed itself in sufficient quantities to make a pasture. But for two or three years Subterranean Clover grew to perfection, having two late springs consecutively. At first it appeared that it would be a boon to the Mallee, because where the Clover was top-dressed with 2cwts. of superphosphate the plants choked out all other grasses and made a thick mat about a foot high, and next year the whole of the crop was sown with this plant. Unfortunately am early summer was experienced, and the Clover did not re-seed itself, and to-day, where it grew so well, there is not a plant to be found.

KING ISLAND MELILOT AND MULTI-SEEDED MILLET.

About the same time King Island Melilot was sown, but this has not grown very well, and its planting cannot be recommended, as the plant taints the milk and is detrimental to cream when sending it away. Another plant which grows well around the garden, Multi-Seeded Millet, was next transplanted around the fences of the paddocks, but this plant would not stand heavy feeding off and soon died.

BURR, CLUSTER, WOOLLY, AND HARE'S FOOT CLOVERS.

These were next sown in small quantities through the drill in 1925, and of these Cluster, Woolly, and Burr are doing well and are now established on the whole of my farm. The planting of Hare's Foot Clover proved a mistake because the growth it makes does not warrant the trouble of sowing it.

WIMMERA RYE GRASS.

In 1928 I planted Wimmera Rye Grass at the rate of about 1lb. of seed per acre; sown through the drill with the crop it has made wonderful growth, and is easily the best grass I have sown. Together with Mr. Griffiths and Mr. Garrett, Government Plant Pathologist, Waite Research Institute, we have searched extensively in the diseased parts of wheat and oat crops, and at no time have we found the Wimmera or the Clover plants a host for any of the fungus diseases. I now have the whole of my farm sown with Wimmera Rye Grass, and the carrying capacity is greatly increased. To-day I have 800 sheep mostly reared on the farm. It yet remains to be seen whether Wimmera Rye will interfere with the growing of wheat; it certainly entails more working of the fallows, and this should prove a benefit so long as one does not attempt to crop more than he has strength to work properly, particularly after the autumn rains, as all the seeds do not germinate with the first rains. To grow feed it is best to work the farm on a four-years' rotation—fallow-wheat-oats-pasture—sowing 1cwt. of superphosphate with the wheat and about 90lbs. on the oats, and then leaving the ground for feed the following year. It is best not to work the fallow in the spring, the light sandy soil drifts badly, and in so doing the seeds are destroyed and blown away. But with keeping sufficient sheep on the fallow to keep it reasonably bare of weeds, I have a pasture consisting of Cape Weed (Dandelion), Cluster, Woolly, and Burr Clovers, and Wimmera Rye Grass. The Cape Weed grows well with the first autumn rains and is a good milk producing feed while it lasts. With the coming of spring the Clovers and the Wimmera Rye Grass grew best, and undoubtedly are the best grasses from then until the next autumn rains. The stock do well on them even after they have matured; neither shed their seeds readily. The stock eat these seeds and so long as they have plenty of water do well on them through the summer.

THE ORIGIN, OBJECTIVE, AND RESULTS OF THE LAMEROO HORSE BREEDING SOCIETY.

[By W. MORCOM, Lameroo.]

(*Pinnaroo Line Conference, Jabuk, August 4th, 1932.*)

In August, 1928, at the Conference held at Pinnaroo, I read a paper entitled "Horse Breeding," in which I pointed out the necessity for breeding some foals every year to maintain the strength of the teams on the farm. In 1928 many farmers were using tractors and held the opinion that horse-teams were out of date. In the criticism that followed it was stated that more money could be made by keeping and feeding sheep than by feeding young horses. One Pinnaroo farmer asked me if I did not think we were out of date by not using tractors. The contents of that paper appeared later in a "Stock Journal," and came under the notice of a breeder of stud horses, Mr. A. J. Melrose, of Mintaro, who is a breeder of Percherons.

Mr. Melrose wrote me and offered to lease one of his stallions, stating also that he was anxious to get the Percheron horse into different parts of the State. He claimed that the half-bred Percheron was a very useful type of horse for farm work. That letter was received by me about the last week in August. At that time I was not in a position to handle a proposition such as was put to me, single-handed, but I thought the idea quite good, so I approached other members of our Bureau, who were also in favor of the scheme, with the result that before the end of that week we had held a meeting, formed ourselves into "The Lameroo Horse Breeding Society," secured stable accommodation, advertised for a groom, and by September 7th we had finalised all arrangements and the horse was at Lameroo. Of course news travels, and all the district knew that the Lameroo Bureau members had formed a horse breeding society and that a stallion was to arrive at a certain date, and much curiosity was aroused, especially as it was several years since any horse breeding had been done in our district. There is one satisfaction that I have in writing this paper to-day, and that is the fact that those farmers in our district who ridiculed what we had done and would have nothing to do with the horse that we were going to use are the sorriest men to-day. In fact one of our most severe critics, who said at the time that such a horse as that should never have come into our district, admitted to me six months ago, when he saw a pair of 2½-year old colts that I was working, that in another year they would be worth £60, and another said he wished he had a dozen of them.

The first year of our venture the horse was leased to us by Mr. Melrose for £40 for that season, and we had a very fair season, serving 47 mares; at the end of the season Mr. Melrose was very anxious that we should purchase the horse for which he wanted £100. After some consideration we decided that we would purchase same, Mr. Melrose agreeing to allow the £40 of lease money to go towards the purchase. We did not go into this business just to see what we could make out of other people, but for our own benefit, and we are prepared at any time to meet any farmer who is outside of our Society if he desires to make use of our horse. Of course, there is a certain amount of expense during the season when the horse is on his round, but during the remainder of the year one member of our Society keeps the horse and works him for his feed.

To show that our scheme has been a success, at the end of October, 1929, after the second season, having purchased the horse and paid about £120 in groom's wages and insurance, we had a credit balance of £57 4s. Since then the horse has not travelled the district, but has been used for members of the Society, and if any other farmers desire the use of same they come to us. In the Lameroo district those young horses will be seen in many of the teams, and they are good workers, quiet and docile, and there is no difficulty in picking them out because they have all turned after the horse for color, which is grey, which was one of the main objections that many people had to the horse.

Now that the horse has come into his own and, I am sure, is likely to remain for a good many years, members of the Agricultural Bureau cannot do better than follow our example and form Horse Breeding Societies—even if you only have 10 members. Buy your horse from reliable breeders, it will be well looked after and better results will be obtained, which has been the experience of our Society. We started our Society four years ago, we have had good success, and we are still going on, and I am pleased to be able to tell the Conference to-day that we are at the present time—although times and prices have been very much against us—in possession of some of the best Clydesdale blood in this State in the form of a two year old colt, and we also have a small credit balance in the bank.

THE DEVELOPMENT OF A HOLDING IN THE HILLS DISTRICT.

[By J. C. Blakely, Scott's Bottom.]

(*Hills Conference, Clarendon, August 25th,* 1932.)

When selecting a property note its natural potentialities, because it is from these that one will eventually plan out the working of the holding. Before arriving at the purchase value one must have a plan of subsequent action before him, also what it is intended to produce and the market value of same.

Clearing should receive first attention, cutting trees at a convenient height to suit the axeman. I do not advocate grubbing trees because the time taken is too valuable for the beginner to lose. I prefer treating the stumps with saltpetre and burning out. The timber should be cut in saleable lengths and stacked, heaping all boughs and rubbish for burning. The heaping of boughs should be done from day to day to prevent further souring of the ground by the tannic acid from falling leaves, &c. Good, shady trees should be left for summer shade, and patches of thick shelter for stock protection in the winter months and at night.

Trees suitable for cutting strainer posts—preferably pink gums—should be sawn in 6ft. 6in. lengths, leaving on the bark until strainers are required. Trees suitable for splitting fence posts should be cut in 5ft. 10in. lengths and split before they dry right out.

FENCING.

If no stock are kept do not worry about fencing until the land is grassed. If cows or sheep are to be kept, it will pay to wirenet because rabbits will soon appreciate your efforts in providing good feed. Place the posts 8ft. apart, 2ft. in ground, 3ft. 10in. out; strainers 2ft. 6in. in ground, 4ft. out; if you do not want to be coming back on your job every week, put up a good fence.

PASTURE.

Scarify the ground between stumps after the first autumn rains. A good, strong, cheap, and handy tool can be made; get a fork of a gum tree about 10in. thick and 4ft. long, such as would be used for a sledge, procure three steel spikes 18in. long by 1in., well pointed, and drill holes to take spikes. Place large cotter pins through ⅜in. holes in the spikes, with washers top and bottom. This tool if drawn over the ground will disturb the surface sufficiently for the reception of Subterranean Clover and Rye Grass. Top dress with 1¾cwts. of 45 per cent. super per acre. If sufficient cash is not available to buy super and seed, do not put in seed, but sow as much super as possible at the rate of 1¾cwts. to the acre, then fence and buy the stock. Do not over-stock, neither stock the holding unprofitably.

Subterranean Clover, Rye Grass, and Kikuyu Grass are best suited for the hillsides. The writer has established Subterranean Clover in the following ways:—Broadcast over ground after scarifying. Broadcast over dirty ground amongst rotted leaves, twigs, etc. Broadcast over oat crop after oats were drilled and harrowed in. Kikuyu Grass—transplanted slips. Rye Grass (English)—transplanted tussocks. The last two respond to every shower of rain in summer, Subterranean Clover leaves the ground bare in hot weather.

HAY.

Meadow hay cut on the green side and well cured should be carefully stored away, together with all other available dry fodder, because it will be very useful in winter. I do not advocate outside stacks, because the rainfall in the hills is too heavy for good preservation.

SUMMER FODDER.

Prepare the best flats by clearing tussocks and draining off surplus water. For a start do not spare the time to put down underground drains, they are expensive and the work must be done carefully to be effective, but put in a main drain to take care of floods. For this district Maize, Millet, Sorghum, Sudan Grass, Barley, Crimson Clover, White Dutch Clover, and Kale will respond well to irrigation. Lucerne, although giving little return the first year must not be overlooked. For a permanent pasture on the flats nothing can beat *Phalaris tuberosa.*

WATER.

A supply of water sufficient for stock and irrigation is an essential. Take advantage of Nature where possible in the reticulation of water; the cheapest method of supply is by gravitation or hydraulic ram if there is a running stream. In any case water will

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nearly always be worth pumping. Overhead watering is more economical and beneficial to plant life than flooding.

PIGS.

Pigs should only be kept to consume waste, because, at present, market prices are below cost of production if food has to be bought.

POULTRY.

At first avoid large numbers, only keeping sufficient for home use.

GARDENING.

Although considered a precarious calling and very often responsible for great losses in cash and labor, gardening should not be overlooked by the beginner owing to the fact that it gives the quickest return. A strawberry patch offers fairly quick returns at little cost and light cartage for the man of small means.

ORCHARD.

Horticultural activities should not be mixed with grazing as a business, it should be gone into on a large scale or left alone, apart from a few mixed apples, pears, plums, and orange and lemon trees for home use.

Half the battle is to treat the farm as a hobby and select that line which makes most appeal. Have an ideal and live and work for it, and endeavor, when established, to produce as much for home use as time will permit. Much time will be saved by planning the work, but do not forget to work to a plan. The most experienced have disappointments, therefore it is evident that the beginner will have his share, more particularly if he knows everything on starting and has not sufficient time to join a Branch of the Agricultural Bureau.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR SEPTEMBER.

[By CHAS. H. BEAUMONT, District Horticultural Instructor.]

The work in the orchard during the next two months is such as will make or mar the crop. We could not have had better weather for the soil, but it was also good for the development of fungous pests, so that our spray programme must be very thorough, and no effort spared to get best results. Bordeaux Mixture and Lime Sulphur will be in evidence at once, and later on Arsenate of Lead.

Everything points to a good crop of apples again, and we must try to ensure that nothing prevents the trees from yielding their best. Consult the Instructor in your district if you are in any doubt what to do, but make sure that all the necessary implements are in good order ready for work, so that no delays occur.

Vines should be treated for Oidium, and see that Downy Mildew does not get a start. Try and take some of the vines off the trellis wires especially where they are becoming constricted; many hundreds of vines were badly damaged on account of this constriction; and further see that the cincturing is properly done. Vines are severely checked by deep cutting; all that is required is a cut through the bark only.

Finish grafting early, and use only wood from trees which are known to be good and of correct type.

The work of cultivating will, of course, have been finished, and all that is necessary is to keep a fine surface. Use the hoe to get all weeds away from the butts of trees. See that surface drains are open in case of floods.

Citrus trees may be planted if you will be able to water them later on. The young trees should be fumigated before being taken into the orchard.

Order new cases in good time and boil all old ones before taking them into the orchard.

If the packing-shed can be closed for a while a good catch of Codlin may be made at windows.

Aphis will be found on peach and plum trees and must be checked as soon as noticed. Black leaf 40, wet or dry, is the best remedy.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

CONFERENCE AT CLARENDON.

Branches of the Agricultural Bureau situated in the Hills District met in Conference at Clarendon on Thursday, August 25th. There was a large attendance of delegates from the Clarendon, Longwood, Kangarilla, Balhannah, Blackwood, McLaren Flat, Scott's Bottom, Cherry Gardens, and Lenswood Branches.

Messrs. H. N. Wicks (Chairman, Advisory Board of Agriculture), W. J. Spafford (Deputy Director), C. F. Anderson (Poultry Expert), C. H. Beaumont, R. Hill, H. J. Apps (District Instructors), H. B. Barlow (Chief Dairy Instructor), R. Fowler (Manager, Blackwood Experimental Orchard), and H. C. Pritchard (General Secretary), attended on behalf of the Department of Agriculture.

Mr. J. Potter (Clarendon) presided and the secretarial duties were conducted by Mr. T. B. Brooks (Clarendon). Mr. H. N. Wicks delivered the opening address. Mr. C. H. Beaumont was then presented with a handsome silver-mounted mulga desk set. Mr. J. Potter, who made the presentation on behalf of the Bureau and the packing shed, stated that this would be the last Conference that Mr. Beaumont would attend in his official capacity, and referred to his untiring efforts in the interests of the fruitgrowers of the Southern district. Mr. Beaumont suitably replied. The following papers were read and discussed:—"Poultry as a payable sideline," Mr. S. Eyles (Clarendon); "Benefits of irrigation on apple trees," Mr. R. Morphett (Clarendon); "The development of a holding in the Hills District," Mr. J. C. Blakely (Scott's Bottom).

A large number of questions were answered during the Free Parliament, and the following resolutions were carried:—1. "That in view of the importance of having the correct type of oil for spraying, we ask that the specifications, namely, viscosity,

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Berkshire Sows, from 8 weeks to 8 months old.
Berkshire-Tamworth Crossbred Sows.
Jersey Bulls and Bull-calves, from Tested Herd-book Cows.
White Indian Runner Drakes and Ducks.
White Leghorn Roosters.
Black Orpington Roosters.

— **FULL PARTICULARS FROM THE PRINCIPAL.** —

sulphonatable residue, volatility, oxidation, reactions, shall be given with all oils sold for use as horticultural sprays.'' 2. ''That this Conference ask the Government to take some action to reduce the price of sugar.'' 3. ''That in the opinion of this Conference the Motor Licences Act as it affects the primary producer should be amended to allow one farmer to carry another farmer's produce.'' 4. ''That all districts that are not in touch with railways should not be 'controlled' roads.'' 5. ''That the yarding fees at the Abattoirs be reduced by at least 20 per cent.'' 6. ''That this Conference ask the Government to remove the licensing of cows.'' 7. ''That the regulations relating to the branding of chilled and preserved eggs be enforced.'' 8. ''That the next Conference of Hills Branches be held at McLaren Flat.''

SOUTHERN PRODUCERS IN CONFERENCE.

Belvidere Branch held for the first time on August 18th a Southern District Conference of the Agricultural Bureau. A very representative attendance of delegates was present from the Langhorne's Creek, Belvidere, Strathalbyn, Monarto South, Murray Bridge, Jervois, Finniss, Port Elliot, Brinkley, Milang, Narrung, Hartley, Currency Creek, Rapid Bay, and Inman Valley Branches.

Messrs. A. J. Cooke, P. J. Baily (Members Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Government Poultry Expert), R. Hill, C. H. Beaumont (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary), attended on behalf of the Agricultural Bureau. Mr. H. A. Eckert presided and Mr. Cooke delivered the opening address. Secretarial duties were capably carried out by Mr. M. S. Pearce.

The following addresses and papers were read and discussed:—''The Present Position of the Primary Producer and His Prospects of the Future,'' Mr. J. M. Cheriton (Belvidere); ''Poultry on the Farm,'' Mr. J. C. Faehrmann (Hartley); ''The Dairying Industry,'' Mr. A. G. Ifould (Port Elliot); ''The Bird Pest and How it Affects Fruit Production,'' Mr. F. W. Allison (Strathalbyn).

A large number of questions was dealt with during the Free Parliament session, and Conference carried the following resolutions:—At a previous Conference a request was made for the subdivision of the Southern District for future Conferences. However, after a lengthy discussion, Conference rescinded this resolution, and decided that the next Conference be held at Goolwa, with arrangements in the hands of the Currency Creek Branch. ''That the Harbors Board be asked to place trucks on the Milang jetty to relieve users of the present haulage charges''; ''that the Harbors Board be asked to make a reduction in the wharfage charges on lakeside jetties''; ''that this Conference of Primary Producers urge that immediate inquiry be made into the cost and durability of duplicate parts of all farm machinery''; ''that the Advisory Board be asked to approach the Salesmen's Association that yard fees be abolished''; ''that a representative be elected from each Conference and appointed on the Advisory Board for the ensuing year''; ''that in view of the activities and unfair tactics of the Society for the Prevention of Cruelty to Dumb Animals, a committee be formed in each district to safeguard our interest in respect to rabbits, horses, and stock generally, and suggest that in case of action being taken in any case, evidence by two experienced farmers or teamsters be accepted in preference to inexperienced persons from the city''; ''that the producer be allowed to use washed super. bags to market barley, oats, potatoes, and onions''; ''that all members under 21 years of age be exempt from subscribing to the *Journal of Agriculture.*''

Conference concluded with an address, ''Malting Barley,'' by Mr. W. J. Spafford (Deputy Director of Agriculture).

Catering was in the hands of a local women's committee. During the afternoon the ladies were addressed by Messrs. Barlow, Anderson, and Beaumont.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on August 31st, there being present:—Messrs. H. N. Wicks (Chairman), A. J. Cooke (Vice-Chairman), A. M. Dewkins, F. Coleman, J. W. Sandford, G. Jeffery, R. H. Martin, S. Shepherd, A. L. McEwin, P. J. Baily, J. B. Murdoch, Professor A. J. Perkins (Director of Agriculture), and H. C. Pritchard (General Secretary).

School Terminal Holidays.—Following the resolution of the Upper Northern Conference, that the second terminal holidays be held concurrently with the Royal Agricultural Show, the Secretary reported that advice had been received from the Director of Education that now that the Royal Show is to be held on a fixed date each year, the school vacation for September, 1933, will commence on the second Friday in September.

RESOLUTIONS: PINNAROO LINE CONFERENCE.

Price of Super.—"That this Conference strongly protests against the high price of superphosphates." This subject will be included in the agenda for the Annual Congress.

Crop Competitions.—"That the Department be requested to supply copies of the Judge's full report of Crop Competitions to members of the Committee and Secretaries of Branches within the district." The Secretary reported that arrangements would be made this year to give effect to this resolution.

RESOLUTIONS: SOUTHERN CONFERENCE.

Yard Fees.—"That the Advisory Board be asked to approach the Salesmen's Association that yard fees be abolished." It was decided to bring the matter under the notice of the association.

S.P.C.A.—"That in view of the activities and unfair tactics of the Society for the Prevention of Cruelty to Dumb Animals, a committee be formed in each district to safeguard our interests in respect to rabbits, horses, and stock generally, and suggest that in the event of action being taken in any case, evidence by two experienced farmers or teamsters be accepted in preference to inexperienced persons from the city." This resolution will be included in the agenda of the Annual Congress.

Southern Conferences.—A resolution was passed rescinding last year's resolution that the district be divided into two districts for Conference purposes.

Yard Fees at Abattoirs.—The Hills Conference carried the following resolution:—"That the yarding fees at the Abattoirs be reduced by at least 20 per cent." It was decided to bring the resolution under the notice of the Stock Salesmen's Association.

OTHER BUSINESS.

Conferences—Holding of.—The Wilmington Branch submitted the following resolution:—"That the District Conferences of the Bureau be held in rotation instead of the present system of voting for place of next Conference." On the motion of Professor Perkins, seconded by Mr. Jeffery, it was decided that at all future Conferences *only one delegate from each Branch represented at the Conference shall vote when deciding the place of the Conference for the ensuing year.*

Life Members.—The following names were added to the roll of Life Members of the Agricultural Bureau:—Messrs. G. L. Tucker (Brentwood), F. G. Bonnin (Pinnaroo), A. Forbes (Monarto South), G. Barrett and H. G. Noske (Shoal Bay). A request from the Caliph Branch that Mr. F. J. Petch, who is not a member of the Agricultural Bureau, should be made a Life Member was not granted.

New Branches.—Approval was given for the formation of Women's Branches a[illegible] Pygery and Mangalo with the following foundation members:—*Pygery*—Mesdames J. [illegible] Heylen, R. Woodrup, J. Davill, W. H. Douglas, J. H. Foster, M. Symonds, E. N. [illegible] M. E. Heath, Misses I., A., and B. Heath, R. and D. Foster, D. Woodrup, O. I[illegible] and G. Heylen. *Mangalo*—Mesdames A. J. Turner, P. C. Cleave, F. Coles, M. Rodda, R. Crittenden, W. Munday, H. Klinberg, O. Honnemann, E. Lathlean, Misses. I. Turner, B. Cleave, and G. Lathleam.

Branch at Hope Forest.—Conditional on obtaining the sanction of the Honorable the Minister to exemption to the payment of 2s. 6d. settlers on the Hope Forest Labor Colony were granted approval for the formation of a Branch of the Agricultural Bureau; the exemption to operate for two years.

New Members.—The following names were added to the rolls of existing Branches:—Koonunga—B. A. Zwar; Marama—J. W. Corbett; Mount Pleasant—T. A. Philps; Rosedale—H. Atkins, J. Mellors; Pinnaroo Women's—Mrs. J. Rice, Mrs. J. Woods, Mrs. G. O'Loughlin; Parilla Well Women's—Miss A. Billing; MacGillivray—J. Elsegood, F. Chapman; Willowie—J. H. Johns, T. E. E. Moutford, J. F. Barrie; Strathalbyn—H. L. Formby; Younghusband—P. Dollard; Taplan—P. Burridge; Nunkeri—N. S. Gill, C. A. Smith; Mount Gambier—N. R. Aslin; Pinnaroo—C. Klein; Petina—T. L. Schultz, P. G. Roberts; Tantanoola—R. Chant; Stockport—D. Higgins; Penola—P. Riddock, P. H. G. Skeer, S. Warner, R. E. R. Lear; Mangalo—Arthur Turner, Russell Turner, H. Burton, John Burton, P. Briese, J. Evely, M. Rodda, A. Klingberg; Macclesfield—R. Scott; Penola Women's—Mrs. J. Renfrey, Mrs. E. O. Fennell; Wirrilla—C. T. R. Hall; Tantanoola Women's—Mrs. Troeth, Miss M. Pycroft, Mrs. Tooth; Warramboo Women's—Mrs. J. Crawford, Mrs. J. P. Patterson, Mrs. V. Lewis, Mrs. M. Sampson, Miss C. Sampson, Miss D. Sampson, Mrs. L. J. Simmons, Mrs. A. M. Steer, Miss A. E. Steer, Mrs. F. E. Deed; Wallala—A. Baldock; Parrakie—A. Afford; Yaninee—W. L. Wilkins; Scott's Bottom—D. Blakeley; McLaren Flat—G. Elliott, H. C. Platts, A. J. R. Powell, Chas. Air, R. Nottage; McLaren Flat Women's—Mrs. J. Smith, Mrs. B. Powell, Mrs. R. Dean; Myponga—H. White, F. Walkley, F. Waterman; Streaky Bay—S. Williams; Narridy—W. G. Johncock, J. Kingner, W. W. Hanson, G. H. Johncock, J. M. Laragy; Nelshaby Women's—Miss T. M. Franks, Miss R. Haines; Jervois—H. Bromley, A. Lockwood, E. Ely, G. G. Bryan, A. O. Forster, N. J. Hutchins, E. Joyce, G. A. Oakley, W. J. Ross, T. Ryan, T. R. Warner, E. S. Wise, E. Bartlett (sen.), E. Bartlett (jun.), T. Bartlett, B. Schultz, Clem Schultz, T. Connell, A. Pinson, W. Upton; Alawoona—Alex. Pengilly, Eric Koch; Gawler River—H. T. Fiedler, E. H. Whiteman, G. R. Hatcher, H. Giles, A. Turnbull, A. Causby, G. T. Brown; Appila-Yarrowie—E. Opperman; Goode—P. J. Rohrlach, P. A. Lange, C. H. J. Schroeder; Laura Bay—R. E. Hoffrichter, W. H. Bailley, E. J. Shearer; Butler—D. C. Stewart, H. W. Savage, Oliver Hickman; Brentwood—W. H. LePoidevin; Bundaleer Springs—T. Cleggett, L. Cleggett, F. Cleggett; Boors Plains—R. Ward, Wm. Harris, G. Harris, A. Harris, G. Smith; Elbow Hill—Rev. H. White, G. F. Wake; Beetaloo Valley—B. W. Giddings; Finniss—A. G. Roberts, M. Burzacott; Inman Valley—T. G. Hodson, J. Scott, C. Tucker; Kalangadoo Women's—Mrs. C. Bennett; Kybybolite—J. M. Wray, W. F. Staude, L. G. Harrison, P. Heffernan, A. E. Heffernan, J. Heffernan (jun.), R. Abbott, M. Williams, W. H. Michell, G. Stewart, J. B. Nolan, J. Nolan, D. Castine, W. Hahan, A. S. Shepherd; Kelly—R. G. Hall; Koppio—H. Brett, K. Low; Balaklava—C. G. Masters, R. A. Schaefer, R. J. Herriot; Kyancutta—H. Schwerdt; Greenock—A. W. Kirchner, T. Kernich (sen.), H. Werner; Laura—E. Pech, V. Pech, L. Klenig; Barmera—R. Simes, E. D. Sims, D. S. Murphy, H. Danvers, R. D. Bonnar, W. Germein, A. G. Snow, E. H. Crocker, J. Bartsch, A. J. Tonkin, F. Rawnsley, A. J. Wright, C. Winterfield, D. McRae, C. C. Chabrel, F. Andrews, H. Dunstone, A. H. Kelly, T. H. Taylor, A. C. Carbins, A. E. Cathro, V. Shepherd; Keith—B. H. Jones; Narrung—P. Hiscock, W. Hiscock, J. Hiscock, J. Hughes, G. Neale, H. Milne; Caliph—A. R. Telfer; Auburn Women's—Miss M. Darby; Clare Women's—Mrs. G. Smith, Miss N. Patullo, Miss A. Lee, Mrs. W. Miller, Mrs. W. L. Moore, Mrs. Corfield, Miss Heinrich, Mrs. G. A. Coles, Mrs. L. Dux, Mrs. A. G. Blight, Miss S. Blight, Miss L. Blight, Mrs. C. C. Gordon, Mrs. E. C. Deland; Dudley—D. I. Telfer; Bundaleer Springs—J. Cronin.

Number of new members, 210; number of present members, 7,906; number of present branches, 318.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. SANDFORD & CO., LTD., reported on September 1st, 1932:—

BUTTER.—Splendid general rains were received in most of the dairying districts throughout August, and as a result the pastures continued in good heart and supplies of cream received by the various factories throughout the State showed expansion each week. The quantity of butter manufactured therefore created fresh records, and the tonnage exported to London has kept up well. Owing to the high standard of quality of the butter submitted for export, London buyers purchased all parcels offering according to market values, so that there has been no difficulty in quitting stocks from week to week. Local trade was well maintained also, and although there were some fluctuations, these were not very great, and the market at present is steady. Choicest creamery fresh butter in bulk, 1s. 2¼d. Prints and delivery extra (these prices are subject to the stabilisation levies); well conditioned store and collectors', 8½d. to 9½d. per lb., at store door, less usual selling charges.

EGGS.—A very heavy seasonal increase in quantities of eggs was recorded during the month, but this was only to be expected, as reports from all the rural centres indicated that production would be heavy this season. Heavy quantities are now being packed for the British market, but a large proportion of the country eggs are not of a high enough standard to pass the graders for this purpose. Values eased throughout the month, and are now getting down to export parity. Ordinary country eggs, hen or duck, 6½d. per dozen; selected, tested, and infertile higher.

CHEESE.—Reports from the South-Eastern districts show that the production of cheese is keeping up well, and there seems to be little doubt but that record quantities of this commodity will be exported. The first consignments for the season reached London last week and was reported on favorably by consignees, so that there should be no difficulty in clearing the surplus throughout the season. New makes, large to loaf, 7¾d. to 8¼d.; semi-matured and matured, 10d. to 11d. per lb.

BACON.—The demand for bacon throughout the month kept up well, and fair parcels were sold interstate. Fortunately the supplies of live hogs in the Abattoirs and country markets have kept up well, so that curers are able to meet all demands for bacon out of stocks. The market has now a firmer tone. Best local sides, 8½d. to 9d.; best local factory cured middles, 9¼d. to 9¾d.; large, 8½d.; local rolls, 6½d. to 7d.; local hams (raw), 1s. to 1s. 0½d.; cooked, 1s. 2d. to 1s. 3d.; lard, prints, 6d. per lb.

ALMONDS.—There has been an exceedingly strong demand for all classes of almonds for many weeks past, and although fair supplies were offering from week to week, these were all readily cleared and buyers were unable to obtain all their requirements. Kernels also have been selling readily and stocks now held by growers are somewhat light, and prices are steady. Brandis and softshells, 9d. to 9½d.; hardshells, 5½d. to 6d.; kernels, 2s. to 2s. 0½d. per lb.

HONEY.—Stocks held by wholesalers and distributors in this State are fairly heavy, as sales have not been sufficient to clear consignments as they came along. Local demand was maintained about up to average, but interstate buyers did not operate so freely as in other years. Prime clear extracted in liquid condition, 4d. to 4½d.; second grade, 2d. to 3d. per lb.

BEESWAX.—Sold freely throughout the month. 1s. to 1s. 1d. per lb., according to quality.

LIVE POULTRY.—As usual during August the supplies of poultry from country districts are not so great as in other periods of the year, and buyers were unable to obtain all their requirements. Turkeys were offering in fairly large quantities and were moderate in prices, but well conditioned fowls and ducks firmed in values, and were in strong request throughout. Poulterers expecting a strong demand because of the Royal Show purchased more freely, and this was instrumental in hardening values. We advise consigning. Crates loaned on application. Prime roosters, 3s. 7d. to 4s. 8d.; nice conditioned cockerels, 3s. to 3s. 6d.; fair conditioned cockerels, 2s. 6d. to 2s. 11d.; chickens lower; heavy-weight hens, 3s. to 3s. 11d.; medium hens, 2s. 6d. to 2s. 11d.; light hens, 2s. to 2s. 4d.; couple of pens of weedy sorts lower; geese, 3s. 6d. to 4s. 6d.; prime young Muscovy drakes, 3s. 8d. to 4s. 10d.; Muscovy ducks, 2s. 3d. to 3s.; ordinary ducks, 1s. 9d. to 2s. 4d.; ducklings lower; turkeys, good to prime condition, 8d. to 9½d. per lb. live weight; turkeys, fair condition, 6d. to 7½d. per lb. live weight; turkeys, fattening sort lower; pigeons, 4½d. to 5d. each.

POTATOES.—5s. 6d. per cwt.

ONIONS.—New season's, 35s. per cwt.

RAINFALL TABLE

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of, and to the end of August, 1932, also the average precipitation to the end of August, and the average annual rainfall.

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	—	3·18	3·16	4·75
Marree	0·14	3·87	3·83	5·93
Farina	0·13	3·88	4·48	6·48
Copley.........	0·52	4·57	5·55	7·95
Beltana	0·55	4·81	5·83	8·59
Blinman	1·52	6·18	8·39	12·00
Hookina	1·52	7·54	8·00	11·42
Hawker........	2·36	10·26	8·61	11·42
Wilson	1·89	9·53	8·09	12·23
Gordon	1·19	6·94	7·19	10·69
Quorn	2·34	10·58	9·23	13·35
Port Augusta ..	1·35	9·96	6·37	9·42
Bruce	1·65	7·87	6·57	9·90
Hammond	1·43	10·63	7·57	11·33
Wilmington	2·44	13·28	12·18	17·50
Willowie	2·19	11·61	8·19	12·16
Melrose	4·10	23·56	16·13	12·16
Booleroo Centre	2·37	16·01	10·35	15·20
Port Germein...	1·60	15·53	8·42	12·45
Wirrabara	2·39	21·23	13·29	19·27
Appila	2·59	15·62	9·87	14·69
Cradock	1·35	7·91	7·40	19·27
Carrieton	1·77	7·25	8·41	12·35
Johnburg	1·23	6·63	7·00	10·63
Eurelia	2·10	8·33	8·82	13·06
Orroroo	1·74	9·22	9·14	13·24
Nackara	1·36	7·79	7·73	11·16
Black Rock	1·77	8·73	8·42	12·46
Oodlawirra	1·42	8·44	7·68	11·62
Peterborough ..	2·37	11·07	8·76	13·24
Yongala	2·56	13·06	9·55	14·44
NORTH-EAST.				
Yunta	1·02	8·78	5·62	8·43
Waukaringa ...	0·93	5·35	5·56	8·00
Mannahill	0·51	4·26	5·51	8·30
Cockburn	0·61	4·93	5·44	7·91
Broken Hill, N.S.W.	0·68	4·79	6·64	9·58
LOWER NORTH.				
Port Pirie	1·86	15·14	9·00	13·19
Port Broughton.	1·37	10·52	9·81	13·93
Bute	2·13	14·59	10·97	15·38
Laura	2·61	18·24	12·17	17·99
Caltowie	2·97	16·03	11·17	16·74
Jamestown	2·88	16·75	11·85	17·75
Gladstone	3·02	14·79	10·91	16·32
Crystal Brook ..	2·10	14·49	10·84	15·81
Georgetown	3·31	16·57	12·57	18·39
Narridy........	2·28	13·11	10·94	15·89
Redhill	2·63	16·23	11·59	15·56
Spalding	3·02	15·57	12·48	19·13
Gulnare	3·27	18·74	12·52	18·62
Yacka	3·15	15·35	10·53	15·32
Koolunga	2·37	13·17	10·63	15·43
Snowtown	2·50	15·18	11·00	15·62
LOWER NORTH—*continued.*				
Brinkworth	2·51	14·99	10·74	15·74
Blyth	1·68	14·33	11·51	16·76
Clare	3·02	21·92	17·12	24·54
Mintaro........	4·09	19·73	16·12	23·34
Watervale	2·88	21·18	18·76	26·91
Auburn	3·13	19·83	16·65	24·00
Hoyleton	1·95	12·31	11·85	17·33
Balaklava	1·59	11·88	10·61	15·52
Port Wakefield .	2·02	10·64	9·23	12·96
Terowie........	1·97	11·31	8·78	13·39
Yarcowie	2·60	12·52	9·14	13·63
Hallett	3·57	16·75	10·99	16·43
Mount Bryan ..	3·87	17·21	11·28	16·70
Kooringa	4·11	16·22	12·24	17·90
Farrell's Flat ..	3·49	16·23	12·90	18·66
WEST OF MURRAY RANGES.				
Manoora	3·85	16·91	12·64	18·82
Saddleworth....	2·99	17·26	13·48	19·54
Marrabel	4·57	18·97	13·68	19·83
Riverton	2·81	17·72	14·39	20·73
Tarlee	2·52	14·87	12·31	18·09
Stockport	2·49	16·31	11·27	16·80
Hamley Bridge .	1·81	14·75	11·29	16·55
Kapunda	3·35	17·01	13·60	19·81
Freeling	2·47	15·28	12·18	17·87
Greenock	2·76	16·37	14·67	21·60
Truro	3·14	15·47	13·73	20·02
Stockwell	3·47	17·45	13·72	20·15
Nuriootpa......	4·07	18·90	14·22	20·62
Angaston	3·06	17·93	15·47	22·43
Tanunda	3·38	17·60	15·36	22·04
Lyndoch	3·04	18·36	16·27	23·48
Williamstown ..	4·12	23·13	19·93	27·63
ADELAIDE PLAINS.				
Owen..........	2·12	12·01	9·71	14·00
Mallala	1·77	13·19	11·45	16·59
Roseworthy ...	2·81	15·25	11·89	17·32
Gawler	2·36	14·68	13·26	18·99
Two Wells	2·02	13·57	11·10	15·74
Virginia	2·30	14·83	12·06	17·14
Smithfield......	3·08	17·49	12·09	17·42
Salisbury	2·92	17·66	13·16	18·55
Adelaide	2·89	20·07	15·17	21·09
Glen Osmond ..	2·78	23·45	18·71	25·95
Magill	3·93	24·34	18·29	25·49
MOUNT LOFTY RANGES.				
Teatree Gully ..	3·27	22·83	19·32	27·29
Stirling West ..	6·62	42·38	34·08	46·78
Uraidla	7·18	46·62	31·97	43·82
Clarendon	4·64	30·88	23·83	32·80
Morphett Vale .	3·35	19·66	16·15	22·59
Noarlunga	3·04	18·94	14·73	20·33
Willunga.......	3·40	22·05	18·96	25·13
Aldinga	3·34	17·82	14·71	22·09

RAINFALL—*continued.*

MOUNT LOFTY RANGES—*contd.*

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
Myponga	4·01	27·11	21·18	28·94
Normanville	2·74	16·88	15·18	20·67
Yankalilla	3·57	18·82	16·77	22·80
Mount Pleasant	4·28	23·46	19·18	27·21
Birdwood	4·42	26·57	20·65	29·16
Gumeracha	4·74	29·15	23·80	33·36
Millbrook Rsvr.	4·24	28·19	24·39	34·95
Tweedvale	4·55	32·54	25·77	35·83
Woodside	4·72	28·98	22·84	32·23
Ambleside	5·33	30·41	24·76	34·88
Nairne	4·70	26·62	19·73	28·13
Mount Barker	6·56	37·53	22·48	31·71
Echunga	5·96	32·65	23·63	33·14
Macclesfield	4·54	24·96	21·36	30·46
Meadows	4·79	32·09	25·47	36·10
Strathalbyn	2·45	13·32	13·48	19·35

MURRAY FLATS AND VALLEY.

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
Meningie	2·29	15·92	13·06	18·42
Milang	2·03	13·33	10·48	14·96
Langhorne's Crk.	2·70	14·07	9·93	14·76
Wellington	2·30	16·67	9·85	14·58
Tailem Bend	2·52	17·57	9·51	14·61
Murray Bridge	2·32	11·50	9·07	13·68
Callington	2·40	12·57	10·32	15·25
Mannum	2·48	10·75	7·83	11·51
Palmer	3·00	14·41	10·11	15·49
Sedan	1·78	9·20	8·27	12·16
Swan Reach	1·74	9·06	6·90	10·61
Blanchetown	1·67	8·55	7·55	11·08
Eudunda	3·27	16·21	11·66	17·12
Sutherlands	2·47	10·44	7·09	10·80
Morgan	1·75	7·86	5·87	9·20
Waikerie	1·75	8·24	6·23	9·69
Overland Corner	2·11	7·51	6·72	10·47
Loxton	2·23	10·41	7·60	11·64
Renmark	2·78	8·89	6·63	10·50

WEST OF SPENCER'S GULF.

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
Eucla	2·15	7·36	7·40	10·04
Nullarbor	2·86	10·28	6·67	8·66
Fowler's Bay	3·44	13·08	9·24	11·70
Penong	3·02	12·10	9·32	11·84
Koonibba	2·68	12·49	8·82	11·46
Denial Bay	2·10	9·23	9·78	10·96
Ceduna	2·58	11·75	7·30	9·75
Smoky Bay	2·63	11·31	7·78	10·20
Wirrulla	2·56	10·50	7·15	9·57
Streaky Bay	3·73	14·26	11·49	14·80
Chandada	3·10	12·25	—	—
Minnipa	3·21	14·15	10·14	13·55
Kyancutta	2·60	13·34	—	—
Talia	3·25	13·58	10·74	14·56
Port Elliston	3·43	16·36	12·61	16·34
Yeelanna	2·91	17·68	11·45	15·73
Cummins	3·22	16·64	12·80	17·46
Port Lincoln	4·24	20·00	14·49	19·37
Tumby	2·73	13·52	9·43	14·00
Ungarra	2·78	14·75	11·44	16·70
Carrow	1·75	10·97	8·52	13·10
Arno Bay	2·07	13·82	8·38	12·40

WEST OF SPENCER'S GULF—*continued.*

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
Rudall	2·25	14·41	8·40	12·26
Cleve	2·37	17·50	10·13	14·62
Cowell	1·09	9·81	7·58	11·14
Miltalie	2·10	14·52	9·32	13·56
Darke's Peak	3·47	16·75	10·40	14·86
Kimba	2·62	13·37	8·29	11·53

YORKE PENINSULA.

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
Wallaroo	1·92	17·00	10·32	13·90
Kadina	1·98	16·95	11·35	15·63
Moonta	1·83	14·87	11·02	15·06
Paskeville	1·87	14·65	11·16	15·52
Maitland	3·01	19·30	14·50	19·91
Ardrossan	1·92	12·44	9·91	13·95
Port Victoria	2·15	14·71	11·09	15·40
Curramulka	3·19	17·45	12·78	17·88
Minlaton	2·63	17·15	12·91	17·82
Port Vincent	2·20	13·63	9·91	14·49
Brentwood	2·55	15·84	10·90	15·44
Stansbury	2·22	14·43	12·02	16·80
Warooka	2·09	14·58	12·96	17·53
Yorketown	2·03	14·12	12·27	16·93
Edithburgh	2·39	15·16	11·77	16·36

SOUTH AND SOUTH-EAST.

Station.	For Aug., 1932.	To end Aug., 1932.	Av'ge to end Aug.	Av'ge Annual Rainfall.
Cape Borda	4·25	23·00	19·39	24·77
Kingscote	3·79	17·76	14·28	19·10
Penneshaw	2·63	17·21	13·50	18·16
Victor Harbor	3·41	21·83	15·21	21·26
Port Elliot	2·51	16.55	14·18	19·94
Goolwa	2·87	16·61	12·65	17·81
Copeville	2·44	11·10	7·16	11·42
Meribah	2·63	12·36	7·50	11·21
Alawoona	1·75	11·18	6·81	10·02
Mindarie	3·79	15·05	7·37	11·89
Sandalwood	3·27	13·94	8·82	13·59
Karoonda	2·79	14·02	9·38	14·34
Pinnaroo	2·18	13·23	9·70	14·62
Parilla	2·59	13·63	9·11	13·91
Lameroo	2·77	14·23	10·54	16·16
Parrakie	2·46	15·12	9·50	14·51
Geranium	2·85	16·17	10·90	16·44
Peake	2·39	14·33	10·72	16·21
Cooke's Plains	2·08	18·06	10·35	15·41
Coomandook	2·22	15·09	11·61	17·22
Coonalpyn	2·79	18·26	11·92	17·44
Tintinara	2·28	17·70	12·63	18·70
Keith	2·08	14·60	12·05	17·91
Bordertown	2·18	16·64	13·01	19·32
Wolseley	2·36	17·50	12·38	18·44
Frances	2·72	16·00	13·39	20·03
Naracoorte	2·78	19·70	15·51	22·62
Penola	2·61	19·29	18·11	26·14
Lucindale	3·21	22·67	16·46	23·11
Kingston	3·85	20·54	17·94	24·33
Robe	3·63	23·23	18·69	24·65
Beachport	4·88	28·55	20·66	27·01
Millicent	4·29	26·07	21·94	29·81
Kalangadoo	3·71	30·36	22·43	32·30
Mount Gambier	4·46	26·58	21·61	30·64

AGRICULTURAL BUREAU REPORTS.

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Angaston	*	—	—
Appila	*	—	—
Appila-Yarrowie	†	2	7
Arthurton	*	—	—
Ashbourne	*	14	12
Auburn Women's	†	—	—
Balaklava	†	—	—
Balhannah	†	—	—
Balumbah	†	—	—
Barmera	†	—	—
Beetaloo Valley	*	12	10
Belalie Women's	†	1	11
Belvidere	*	—	—
Berri	*	14	12
Big Swamp	*	—	—
Blackheath	†	15	20
Black Rock	*	—	—
Black Springs	†	13	11
Blackwood	†	12	10
Block E	*	—	—
Blyth	221	23	28
Booleroo Centre	*	9	14
Boolgun	*	—	—
Boor's Plains	†	8	6
Borrika	*	—	—
Bowhill	†	12	10
Brentwood	230	1	6
Brinkley	*	14	12
Brinkworth	*	12	10
Brownlow	222	—	—
Buchanan	*	—	—
Bugle	*	13	11
Bundaleer Springs	*	—	—
Bunora	*	—	—
Bute	*	15	20
Butler	*	—	—
Calca	*	—	—
Cadell	*	—	—
Caliph	*	6	4
Caltowie	*	—	—
Canowie Belt	*	—	—
Caralue	*	14	12
Carrow	*	14	12
Chandada	*	—	—
Charra	*	—	—
Cherry Gardens	†	10	8
Clanfield	*	—	—
Clare	*	—	—
Clare Women's	†	—	—
Clarendon	*	12	10
Cleve	†	3	1
Cobdogla	*	—	—
Collie	*	7	5
Colton	*	—	—
Coomandook	235	29	27
Coonalpyn	*	—	—
Coonawarra	*	15	13
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	—	—
Cummins	†	9	14
Cungena	†	1	6
Currency Creek	†	12	17
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	—	—
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Eudunda	*	5	3
Eurelia	†	10	8
Eurelia Women's	†	7	5
Everard East	†	—	—
Farrell's Flat	*	30	28
Finniss	*	—	—
Frances	*	—	—
Frayville	†	—	—
Gawler River	*	—	—
Georgetown	*	10	8
Geranium	*	24	29
Gladstone	*	9	14
Gladstone Women's	†	9	14
Glencoe	*	13	11
Glossop	*	—	—
Goode	†	14	12
Goode Women's	†	14	12
Greenock	223	—	—
Green Patch	†	15	13
Gulnare	*	—	—
Gumeracha	*	12	17
Halidon	*	—	—
Hanson	*	13	11
Hartley	*	—	—
Hawker	*	—	—
Hindmarsh Island	†	—	—
Hookina	*	—	—
Hoyleton	*	19	17
Inman Valley	*	15	20
Ironbank	*	—	—
Jamestown	*	26	24
Jervois	†	8	13
Kalangadoo Women's	†	10	8
Kalangadoo	*	10	8
Kalyan	*	21	19
Kangarilla	*	—	—
Kangarilla Women's	†	15	20
Kanmantoo	†	—	—
Kanni	*	—	—
Kapinnie	*	16	14
Kapunda	*	9	14
Karcultaby	*	—	—
Karoonda	*	14	12
Keith	*	15	13
Kelly	†	10	8
Ki Ki	†	—	—
Kilkerran	†	13	11
Kongorong	*	12	10
Koolunga	†	—	—
Koonibba	*	8	13
Koonunga	*	—	—
Koppio	*	13	11
Kringin	*	12	17
Kulkawirra	*	13	11
Kyancutta	233	6	4
Kybybolite	*	15	13
Lameroo	*	10	8
Langhorne's Creek	†	14	12
Laura	*	17	15
Laura Bay	233	—	—
Lenswood and Forest Range	†	—	—
Light's Pass	†	—	—
Lipson	†	10	8
Lone Gum and Monash	†	14	12
Lone Pine	*	12	10
Longwood	*	—	—
Lowbank	*	14	12
Loxton	*	9	14
Lucindale	*	—	—
Lyndoch	*	13	11
McLaren Flat	†	—	—
McLaren Flat Women's	*	1	6
Macclesfield	†	15	20
MacGillivray	*	13	11
Mallala	*	19	17
Maltee	*	15	13
Mangalo	†	—	—
Mannanarie	*	—	—

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Millendilla	*	—	—
Millicent	†	30	28
Millicent Women's	†	—	—
Miltalie	234	10	8
Mindarie	*	2	7
Minnipa	*	—	—
Modbury	*	14	12
Monarto South	238	—	—
Moonta	*	—	—
Moorlands	237	14	12
Moorook	*	—	—
Morchard	220	9	14
Morphett Vale	*	—	—
Mount Barker	*	14	12
Mount Bryan	†	—	—
Mount Compass	†	1	6
Mount Gambier	†	9	14
Mount Hope	234	13	11
Mount Pleasant	†	—	—
Mount Remarkable	*	—	—
Mount Schank	*	—	—
Mudamuckla	*	10	8
Mundalla	†	—	—
Murray Bridge	*	—	—
Murraytown	†	—	—
Mypolonga	*	—	—
Myponga	245	15	20
Myrla	*	14	12
Nantawarra	†	15	11
Naracoorte	*	10	8
Narridy	†	—	—
Narrung	†	—	—
Nelshaby	*	—	—
Nelshaby Women's	*	—	—
Netherton	†	14	12
New Residence	*	—	—
North Booborowie	*	—	—
Nunjikompita	*	15	13
Nunkeri	*	14	12
O'Loughlin	*	12	10
Orroroo	*	—	—
Overland Corner	†	14	12
Owen	†	9	14
Palabie	†	—	—
Parilla	238	27	25
Parilla Women's	†	21	19
Parilla Well	242	20	18
Parilla Well Women's	†	20	18
Parrakie	*	—	—
Parrakie Women's	*	26	25
Paruna	†	2	7
Paskeville	†	13	11
Pata	*	2	7
Penneshaw	*	—	—
Penola	†	3	1
Penola Women's	†	—	—
Penwortham	†	15	13
Petersville	*	13	11
Petina	†	24	22
Pinbong	*	—	—
Pinkawillinie	*	—	—
Pinnaroo	†	—	—
Pinnaroo Women's	†	2	7
Port Elliot	*	—	—
Pygery	†	13	11
Quorn	*	—	—
Ramco	239	12	10
Rapid Bay	*	—	—
Redhill	†	—	—
Rendelsham	†	13	8
Renmark	†	—	—
Rhynie	*	—	—
Richman's Creek	*	15	13
Riverton	†	12	10
Riverton Women's	*	—	—
Roberts and Verran	*	—	—
Rosedale	†	20	11
Roseworthy	*	—	—
Rosy Pine	*	—	—
Rudall	*	13	11
Saddleworth	230	16	14
Saddleworth Women's	*	6	4
Salisbury	*	—	—
Salt Creek	*	—	—
Sandalwood	*	—	—
Scott's Bottom	†	9	7
Shoal Bay	†	13	11
Smoky Bay	†	—	—
Snowtown	†	9	14
South Kilkerran	230	13	11
Spalding	*	—	—
Springton	*	7	5
Stirling	*	—	—
Stockport	†	—	—
Strathalbyn	*	—	—
Streaky Bay	†	23	28
Tailem Bend	*	22	20
Talia	*	30	28
Tantanoola	†	3	1
Tantanoola Women's	†	7	5
Taplan	243	13	11
Taragoro	†	15	13
Tarcowie	*	—	—
Tarlee	†	20	11
Tarpeena	*	—	—
Tatiara	†	—	—
Thrington	*	—	—
Tintinara	*	—	—
Truro	226	12	10
Tulkineara	*	15	13
Tweedvale	*	15	20
Two Wells	*	—	—
Ungarra	*	22	20
Upper Wakefield	†	15	13
Uraidla and Summertown	*	5	3
Veitch	*	—	—
Virginia	*	—	—
Waddikee Rocks	*	10	8
Waikerie	*	9	14
Wallala	†	14	12
Wanbi	*	28	26
Wandearah	*	13	11
Warcowie	†	13	11
Warcowie Women's	†	13	11
Warramboo	†	13	11
Warramboo Women's	†	—	—
Wasleys	†	8	13
Wasleys Women's	†	1	6
Watervale	*	19	17
Wauraltee	*	13	11
Weavers	†	12	10
Wepowie	†	5	3 & 31
White's River	*	13	11
Whyte-Yarcowie	*	—	—
Wilkawatt Women's	*	—	—
Williamstown Women's	†	7	5
Williamstown	*	—	—
Willowie	†	26	4
Wilmington	†	20	18
Windsor	*	—	—
Wirrabara	*	—	—
Wirrilla	†	10	8
Wirrilla Women's	*	2	6
Wirrulla	*	21	17
Wolseley	*	12	10
Wudinna	*	—	—
Wynarka	*	—	—
Yacka	*	—	—
Yadnarie	*	13	11
Yallunda Flat	*	—	—
Yandiah	†	9	14
Yaninee	*	—	—
Yantanabie	*	—	—
Yeelanna	*	14	12
Yorketown	*	—	—
Younghusband	*	—	—
Yurgo	†	—	—
Yurgo Women's	*	—	—

*** No report received during the month of August. † Held over. x In recess.**

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

WOMEN'S BRANCHES.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Penola	17/8/32	160	Annual Social	Mrs. E. Kidman
Auburn	26/8/32	22	Annual Meeting	Miss L. Dennison
Clare	27/8/32	24 and 11 visitors	Address—Mrs. Christison.	Mrs. A. Rogers
Williamstown	3/8/32	9	Paper—"Palms and Ferns," Mrs. Hammatt	Mrs. A. Cundy
Clare	3/8/32	19	Address—J. B. Harris	Mrs. A. Rogers
Gladstone	12/8/32	16 and 40 visitors	Address—Mrs. Alvey	Miss M. Sargent
Pinnaroo	5/8/32	15	Annual Meeting	Mrs. F. Atze
Eurelia	6/8/32	19 and 8 visitors	"Rugmaking," Mrs. Orchard	Mrs. E. Wall
Wasleys	4/8/32	45	Papers—Members Williamstown Branch	Miss G. George
Parilla Well	19/7/32	19	Annual Meeting	Mrs. J. Johnston, Pinnaroo

SOUTH-EASTERN.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Millicent	12/8/32	12	Paper—"Horses *v.* Tractor," G. Major	E. Mitchell
Penola	17/8/32	160	"Development of South-East," H. Richardson	F. Hinze
Tantanoola	6/8/32	10	Discussion	H. Kennedy
Rendelsham	13/8/32	8	Question Box	F. White
Rendelsham	16/7/32	7	Annual Meeting	F. White
Mundalla	18/8/32	19	Annual Meeting	A. Ross

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.59in.).

May 20th.—Present: 12 members.

Rabbits and Foxes.—Mr. P. Schultz read the following paper:—"The prevalence of these pests is mostly due to neglect on the part of the landowners. In time of drought and lean years people are not aware of the fact that a few days' rabbiting would go a long way towards clearing their holdings and keep them in check. Half the battle lies with landowners to see that the netting is kept rabbit proof. The best way to get rid of rabbits is to dig out the burrows and leave them open so that the next lot cannot get established. Plenty of dogs and a gun will soon account for those remaining. Poisoning is another means of destroying, and also traps, but trapping takes a long time and one must be constantly on the job. In fumigating it is essential to see that all rabbits are chased into the burrows so that after fumigating the rabbits outside cannot dig in and allow the fumes to escape. Rabbits and their destruction involve farmers and pastoralists in heavy expense, but on the other hand thousands of men are employed killing and skinning at the present time. If skins remained at a reasonably good price all the year, rabbit trappers would soon wipe out the pest. The fox is another pest that destroys more than it is worth, but it is more easily kept under control than the rabbit. If all occupiers of land made a habit of poisoning, foxes would soon disappear. Strychnine with soda is very deadly, and the most effective bait is a young lamb. Birds of any kind or fish and mice make an excellent decoy. Poison the mouse and put it down the mouth of a mouse hole in the trail of the fox. Dogs and guns are also helpful. In poisoning foxes for their pelts, it is advisable to lay baits convenient to water so that the fox, after taking the bait, will drink, and so hasten the action of the poison. (Secretary, A. McCallum.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Murraytown ...	19/8/32	11	Debate—" Railways *v.* Motor Transport "	E. Pitman
Warcowie	9/8/32	19	Discussion	A. Crossman
Wilmington ...	9/8/32	18	Conference Report	P. Cole
Wepowie	2/8/32	12	" Protection," E. Roocke	E. Roocke
Willowie	7/8/32	19	Annual Meeting	L. Crisp
Wepowie	5/7/32	14 and 42 visitors	Debate with Morchard ..	E. Roocke
Eurelia	6/8/32	16	Address—E. L. Orchard .	E. Wall

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 18.76in.).

June 3rd.—Present: 11 members.

Care of the Brood Mare.—Mr. A. Webber contributed the following paper:—"Most farmers work their mares up to within a week or two of foaling. There is no harm in that, providing the work is not too heavy or the hours too long. If in-foal mares are working, they should be stabled in a separate yard at night and given extra feed with a little corn. Never work a mare in foal where she has to bog through mud; this is often the cause of a mare slipping her foal. Some farmers sow a small paddock of barley for the mares, work them up to within a week of foaling, and then turn them in on the barley. This usually results in the mare gorging herself, and she becomes bloated. She may go on to time of foaling. Then there is trouble in the form of a wrong presentation of the foal, caused by the overloading of the stomach. If a little more thought was given to the mare, much trouble and a lot of mares and foals would be saved. I am not in favor of mares being moved to new quarters a day of two before foaling, especially mares carrying first foals, because the mares select their place of foaling days before the event comes off. It is as well to keep a close watch on the mares when about to foal, but if possible without being seen by the mare, especially young mares; some are very nervous and may wait for hours if they think they are watched. Very often a little help at the right moment will save a foal and possibly the mare, but unless one has had experience, do not attempt to deliver the foal by pulling too hard. If the foal is pulled back too far it may be impossible to get it forward again in the event of wanting to turn it or straighten the head or a leg. Always use disinfectant when handling the foal. If it is necessary to secure help, do so without delay as soon as there are signs of trouble. If the cleansings do not come away in 24 hours, remove them. Do not tie weights on them; this may result in some internal injury. If the foal will not suck, it is fairly safe to presume a stoppage; give a dose of oil and an injection at once. That in most cases will put things right. If one has to take the foal without assistance, disinfect the hand before inserting it into the mare. Feel the position of the foal, then proceed to straighten him and get him in position for removing. If a mare slips her foal and there are other mares in foal, keep her away from them and wash her well with strong disinfectant. Abortion is contagious.'' (Secretary, L. Mugge.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Yandiah..	12/8/32	11 and 40 visitors	Annual Social	F. Jettner
Koolunga......	16/8/32	12	Milk Testing Demonstration, T. Dyster	I. Jones
Beetaloo Valley	13/7/32	12	Annual Meeting	B. Giddings
Mount Bryan ..	23/7/32	—	Annual Meeting	A. Jefferies
Appila	4/8/32	11	Address—L. Judell	E. Wurst
Redhill	26/7/32	9	Question Box	S. Pengilly

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BROWNLOW.

June 15th.—Present: 17 members and 17 visitors.

Improvement of the Farm Flock.—Mr. E. Schiller read the following paper:—''Farmers have realised that the keeping of sheep on the farm is a necessity. A small flock of sheep should be kept on the farm all the year round for the purpose of compacting the soil, keeping fallows clean, and supplying the household with mutton, and at the same time the sheep would show a handsome return for the wool. The aim should be to get the most suitable type of Merino to grow wool. What is required is a large-framed, plain-bodied sheep carrying a good fleece of medium, strong wool, density of fleece is essential. Wool that is loose and open will carry dust readily. The English bred ewe tends to lose in weight of wool after the second lambing. Avoid sheep with coarse breech wool, also with too many wrinkles over the body. A wrinkly sheep cannot stand up to hard conditions as well as the plain-bodied sheep. With lambs, however, unless they have wrinkles when they are young you cannot have a close-woolled sheep, because as the frame grows the skin is stretched, and if there are no wrinkles to supply the necessary extension the skin must become taut and the wool fibres wide apart. There are some wrinkles, however, which must be avoided even in lambs. The first is a pocket under the chin which collects and carries grass seeds, the one which runs up the side of the face below the eye, another down the side of the tail, another on the side of the flank. The art of the breeder lies largely in judicious mating, to correct faults, and to perpetuate good points. Two considerations are important in the matter of selection. Carelessly practised breeding may lead to reduced fertility and vigor. The sires and dams to be used should, if possible, be bred and reared in distinctly different environmental conditions, or, failing difference in the environment, the families from which the sires are selected should not be persisted with for too great a length of time. In choosing a sire it is always advisable to buy him as nearly as possible in his natural condition. Many young rams are so artificially forced that their development appears abnormal. Often, however, this development does not continue. Sheep should be carefully culled once a year. This is best done a few days before shearing. Examine the wool carefully—length, density, and character are the three essential points. Culling as hoggets can be done much more satisfactorily; it is a difficult job to cull ewes that are rearing lambs. Keep sheep in fair condition all the year round; if a sheep is kept in poverty it cannot grow its true type of wool and the lambs will also suffer. To make the keeping of sheep a pleasant job the owner should have good fences and build a set of yards large enough to work his flock without much manual effort. There will be little justification for erecting a wool shed on the farm. If a barn is wisely planned it can readily be fitted up for shearing. A few spare sheep hurdles should always be kept on the farm.'' In the discussion that followed Mr. A. O. Steinbomer asked when lambs should be dropped. Mr. Schiller preferred May and June. Mr. W. Roocke said plain-bodied sheep did best in drought years. Mr. H. Roocke said old ewes should be used for mating with mutton breed rams. Lambs should be tailed at two weeks of age. (Secretary, F. Roocke.)

GREENOCK (Average annual rainfall, 21.60in.).

June 27th.—Present: 39 members.

MANAGEMENT OF FARM HORSES.—Mr. Braunack read the following paper:—''The efficiency of farming to a very great extent depends on the ability of the farmer as a caretaker of his farm team, hence also the success or failure of balancing the ledger. The team should at all times be kept in such a state as to be fit for work at the shortest possible notice. It is wrong to keep horses on short rations when not working. If you give the team a spell have a recuperative tendency in view. At all times the horse should receive as much wholesome food as it can eat, but certainly no more than it desires. The manger should be cleaned up at least once a day. Ample water—three or four drinks a day—when the team is at work, is also an essential factor. The brush and comb must not be neglected for they have a wonderful result towards keeping a smooth coat, and generally upholding the health of the team. Great consideration is necessary also not to overburden horses by excessive loading. I cannot emphasise this point too strongly, for it has a very great bearing on the length of life of the farm team. Sore shoulders are in most instances due to carelessness. Collars must be kept clean from sweat and dust. It is wise to use a stiff brush on the lining now and again; this will also remove loose hair. Felt pads strapped on to the collar on both sides of a sore will permit one to work a horse without any inconvenience to it. There are numerous other cures and preventives, such as a fresh super-bag under the collar, or gall-cure, black-lead, and grease mixed into a paste. In some instances wooden collars are a great help, and above all, a good fitting collar is about the most reliable preventive of all for sore shoulders. Attention is necessary in many ways to protect the horse's condition, and a most important one is his hoof, when working on roads or rough, stony country. To neglect a tender-footed animal will reduce his condition and very much reduce the freedom of walking and thereby considerably reduce the pace of the team. The horses' teeth are neglected on most farms, but attention to these occasionally will also help towards the general welfare of the animal. The breeding of a suitable type of horse for the farm needs every consideration. This, however, seems to be generally neglected. To commence with, suitable mares are a great (perhaps the greatest) point to consider. It is folly to breed from a mare that is of little account in the team. I prefer to breed from the ablest that is procurable, for in practically all events it is found that the progeny will inherit the short-comings of its progenitor. The mare must necessarily be well proportioned and roomy, good hind-quarters, round ribs (which means round barrel), not too long in the back, good shoulders, short neck, short ears, short mouth, and eyes placed well apart in forehead, and a sound, reliable worker. The sire would be a taller horse, the same good qualities of the mare, and an active walker. Having a mare in foal, all due care must be taken when working not to overburden. Steady work right up to the time of foaling is beneficial to the mare and foal. Attention at birth is very helpful as it will prevent unnecessary labor. After foaling I prefer not to work the mare if at all possible, for this tends to check the mare's milk flow and certainly interferes with the general welfare of the foal. In this district a young horse should not be given hard work until three years of age. When purchasing, care must be taken. The horse should be firstly examined at the manger and there encouraged to eat if possible to ascertain its ability to consume food without slobbering and the condition of his teeth. It can be taken for granted that a sprightly looking animal will pass the health test, whereas, on the other hand, a sluggish animal with a drooping head may be suspected of internal disease. (Secretary, H. Wilksch.)

SADDLEWORTH (Average annual rainfall, 19.54in.).

May 20th.—Present: 15 members.

VALVE GRINDING.—Mr. R. Hannaford read the following paper:—Nearly every farmer has an internal combustion engine, either in the form of stationary engine, car, truck, or tractor. Any of these need attention at times according to the amount of work they are required to do. There are two things which have to be done more often than anything else, that is, decarbonising and valve grinding. In decarbonising, all the carbon must be scraped away with a blunt instrument from the piston tops, valve ports, cylinder heads, &c., because when the valves are ground in the engine will be open ready for decarbonising, and in grinding in the valves anyone would clean off all the carbon at the same time. There is one type of engine—that with the solid head—which requires extra dismantling for decarbonising when doing the valves. Some of the symptoms of valve trouble are loss of power, bad running, difficult starting, misfiring, back firing in the silencer. The simplest test is to pull the engine slowly over each compression by the starting handle and note what amount of compression each cylinder has. It must not be forgotten that there are other causes of bad compression, such as leaky piston, partial failure of lubrication, incorrect tappet adjustment, leaky valve plugs or head gasket. It is not a good proceeding to decarbonise an engine and leave the valves, for while the engine is dismantled the extra labor and expense in grinding in the valves is little. Most engines in use can be divided into three classes, so far as the valves are concerned:—1. The side-by-side valve engine with detachable head. 2. The overhead valve engine, also with detachable head. 3. The side-by-side valve engine with solid head to cylinders, the valves being removable through valve caps or plugs over them. *Side-valve Engine.*—To obtain access to the valves, various fittings and connections have to be dismantled in all engines. First there comes the head. The most important point with this is to slacken off the securing nuts a little at a time until they are all loose. If this is not done it is likely to lead to distortion, or even cracking of the head casting. The nuts all being off, the head should be carefully removed, taking great care not to injure the copper asbestos gasket between it and the cylinder face. The gasket should be removed from the cylinder face carefully by the aid of an old table knife, and put on one side. Care should be taken to see if the valves are numbered to their seats. In some makes of cars this is not done. It is a great work saver, so in cases where there is no number, it is a good plan to lightly mark the number on each with a centre punch, numbering from the front end of the engine. Keeping valves to their own seats saves extra work in re-grinding. Some makers use different metals or methods of construction for the exhaust valves, so that these should be kept as exhaust valves. To withdraw the valves, the valve cotter holding the spring washer on the valve stem must be withdrawn. To do this, the tension of the valve spring must be removed by further compressing it up the valve guide. To do this it is well to have the proper tool for the job. These can be bought or even made suitable for the job in hand. Extra strong springs in big heavy duty engines take some compressing, so that whatever is used it must hold securely, because if it slips or releases the fingers are likely to be injured. The spring having been compressed by raising the spring washer against it, next remove the cotter, taking care not to drop it in the valve spring chamber or it may go right through into the crankcase. While the spring is still compressed, prise up the stem of the valve with a screwdriver and withdraw the valve by hand. Now is the time to inspect the valves. Generally the exhaust valves will be found to be in the worst condition, but if one or more valves have been held up off their seats, either inlet or exhaust, burning may have taken place, and if badly burnt would render the valve or valves useless for further work, and also make it necessary to recut the seats in the cylinder casting. If any valve is badly burnt do not waste time over it, throw it out and replace with a new one. Damage to the valve seat is more serious and must be remedied, a new cylinder casting is a very costly matter. Unless the burning is very bad it is possible to re-cut the seat and use a valve of the original size, but in bad cases it is sometimes necessary to fit a new valve with a larger head. The first thing to do, once all the valves are out of the engine, is to clean them, especially the stems. Well wash with kerosene to remove all grease, then dry, clean off all hard carbon deposit both above and below the head of the valve, not forgetting the stems. Pay special attention to the valve seating, clean off all hard scaly deposit usually found in it—this will save time grinding in, also blunting the seat cutters if this has to be done. Polish the valve stems with fine emery cloth, finish the polishing, and remove any fine ridges which would favor the formation of carbon deposit. *Valve Faces.*—If the faces of the valves are in bad condition skim up the faces in a valve-truing lathe or tool. These tools can be purchased quite cheaply, so there is little excuse for not truing up the valves. *Valve Seats.*—See if the seats require any attention before grinding in the valves. If the seats are badly worn or burnt they must be cut down to obtain a new seat. Tools for this purpose can be purchased cheap, and will do the job quickly and well if used with care. In doing this part of the work great care must be taken, and as little as possible removed from the seats. It is obvious that the seat is widened by cutting down, and it is very important that the seat should be as narrow as possible, because the wider the seat the more chance of leakage and burning. Assuming that all the valve seats have been re-cut, it will be necessary, before commencing to grind in the valves, to lower the tappet screws. On some engines no tappet adjustment is provided, and after re-cutting the valve seats enough metal must be removed from the ends of the valve stems to give sufficient clearance for grinding. In some makes the push rods can be drawn out of their guides, being simply pieces of plain iron. If this can be done it is best not to reduce the height of the valve stem until they have been ground in. Clean out the valve guides with kerosene so that the valve stems drop freely through the guides. If these guides are badly worn replace them. For grinding in the valves many different preparations are sold, but all of these have some abrasive material such as emery, carborundum, &c., mixed with a lubricant such as vaseline to enable them to be handled easily. If the valves and seats have been re-cut properly there is no need to use a coarse grinding material. *Grinding In.*—Put all the valves in their own seats, commence with the end valve, lift it out and smear a small amount of grinding material in the seat, distributing it equally all around. Replace the valves, and with a screwdriver or grinding tool lean lightly on it and turn it two or three half-turns in its seat, then lift the valve by the stem and give it a slight turn, again give several half-turns, then lift as before and repeat the process several times. Withdraw the valve and with a clean rag wipe the face and the seat and carefully examine. There should be a faint grey-colored line all around the valve face and seat, and the line should be equal with and parallel with the top rim of valve. If the line is not continuous all around the valve apply more grinding material and repeat the operation of grinding. Do not over-do it, once there is a true face formed on the valve and seat any further grinding will form a ridge on the valve face. See that there is a good face line on the seat as well as the valve before being satisfied that the grinding is finished. To test this engineer's blue can be smeared over the valve face, replace the valve and revolve; this should leave the color distributed all over the seat. When all the valves have been ground in, the greatest care should be taken to remove all traces of grinding material. The valves should be washed in kerosene, the seats wiped out with a cloth soaked in kerosene, the valve guides should also be cleaned by the same means. Then lightly oil the stems and put the valves in their correct places and replace springs, spring washers, and cotters. The valve tappets must now be adjusted. It is best to follow the instructions of makers of the engine in making this adjustment, because different engines

1932 CALENDAR 1932

MAY

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15	16	17	18	19	●	21
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JUNE

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JULY

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24	25	26	27	28	29	30
31	...	...	...	...	...	...

AUGUST

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SEPTEMBER

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11	12	13	14	●	16	17
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OCTOBER

S	M	T	W	T	F	S
30	31	...	...	...	...	1
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23	24	25	26	27	28	29

NOVEMBER

S	M	T	W	T	F	S
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27	28	29	30	...	...	...

DECEMBER

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11	12	●	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

1933 CALENDAR 1933

JANUARY

S	M	T	W	T	F	S
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FEBRUARY

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MARCH

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APRIL

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23	24	25	26	27	28	29
30	...	...	...	...	...	...

MAY

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	●	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	...
...	...	...	...	...	...	...

JULY

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...	...	...	...	...	...	1
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AUGUST

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SEPTEMBER

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24	25	26	27	28	29	30
...	...	...	...	...	...	...

OCTOBER

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NOVEMBER

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DECEMBER

S	M	T	W	T	F	S
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24	25	26	27	28	29	30
31	...	...	...	...	...	...

● FULL MOON.

require different tappet clearances. It is well after a short run of the engine to check tappet clearances, because the valves tend to bed in in running after they have been ground in, thereby decreasing the tappet clearance, which may cause the valve to be held off its seat, and then loss of power will result, and probably the valve and seat damaged. Extreme clearance does not affect the power to any great extent, but makes the engine noisy, and it is to be avoided on that account. Any clearance less than .004 should be obtained in two stages. The clearance should be set to this after grinding in, and then when the engine has run for some hours at least and while it is warm, the correct clearance should be given. This work must not be done by guess, but with feeler gauges, which consist of a number of blades like those of a penknife folding into a handle each blade being of a different thickness, usually from .002 up to .019. *Engines which have no tappet adjustment.*—It sometimes happens that too much metal has been removed from the valve stem. In this case, use must be made of a cap which fits over the end of the valve stem and a supply of small steel discs which fit inside the cap. Before replacing the head of a side by side valve engine, the tappets should be set. Usually three spanners are required, two of the same size to fit the tappet screw and its lock nut, and another usually smaller to fit the flats in the tappet spindle; a feeler gauge is also required. Holding the tappet spindle, screw the tappet screw up or down as necessary, until the feeler gauge blade will just pass between the bottom of valve stem and top of screw. It is advisable to leave the spanner on the tappet spindle and move it round until it leans in one of the other tappet guides to prevent it going further. Then hold the tappet screw with one spanner, screw down the lock nut with the other spanner. Again test the clearance with feeler gauge. It will probably be found to have varied, if so, hold the tappet spindle and with a spanner try and screw the tappet screw the way required, if possible without disturbing the lock nut. For this reason the lock nut should not be done up too tight at first. *Adjustment.*—When the correct clearance is obtained screw up the lock nut tight. Do each valve in turn, and when finished give a final check over and replace valve chamber cover. The overhead valve clearance is adjusted in the same way with the exception of a few special types. Some of these have an eccentric bush supporting the rocker arm, which, when turned, increases or decreases the clearance as desired. In all cases the clearance should be tested again when the engines are warm or have done some running, especially overhead nature types.

The Chairman, Mr. L. J. Burton, who had donated £1 1s. towards the prize money, presented the prizes won in the Saddleworth Crop Competition. First, Frost Brothers, Manoora, 87.5 per cent., salad bowl; second, F. Coleman, Saddleworth, 87 per cent., silver vase; third, C. H. Behn, Riverton, 86 per cent., biscuit tray; fourth, A. J. Jones, Manoora, 84.5 per cent., jardiniere. (Secretary, F. W. Coleman.)

TRURO (Average annual rainfall, 20.02in.).

June 13th.—Present: 16 members.

DAIRYING.—In the course of an address on this subject, Mr. T. Roennfeldt, of the Greenock Branch, said:—"Butter prices were very low, but the fault was mainly on the side of the farmer, who did not give the cream sufficient attention. Although England had imported 14 million lbs. of butter from us recently, there was more second grade butter going on to the market than should be. Cows being so high priced and most of the dairy herds sold as calves previously, it was only now that herds were being built up again. Small paddocks were recommended for dairying because large paddocks were deemed too expensive. Cows did not want much exercise ,and if placed in small areas made more use of the feed. Changing the paddocks used every several days made the cows more contented. Plenty of clean drinking water was essential, especially during summer. Put down an early crop of Cape barley for greenfeed. Oats although a little better make good grazing. In top dressing grazed land superphosphate is better than sulphate of ammonia, the fodder remaining in a green stage longer with the use of superphosphate. The Jersey breed is favored over the Shorthorn because it gives richer milk although the Shorthorn produces better calves. The Jersey when acclimatised in Australia becomes hardy, although at times a reverse opinion is stated. Stable the cows at night and give a ration of 20lbs. hay chaff, 4lbs. crushed oats, 3lbs. bran, 2lbs. Meggitt's linseed meal, 1 small handful of salt, 1 handful of Cresco concentrate or 100 per cent. super. per day, if plenty of feed about, cut the ration in halves. Meggitt's is a good medicine and gives a gloss and topping to the cows, although they do not take to it at first and it can be overfed. Feed cows 2lbs. of Meggitt's per day when they are turned into the stubble. Dry bible need not be feared if Meggitt's is used. Use the skim milk for feeding pigs. The Berkshire-Tamworth cross sow put to a White boar produces a white pig required by exporters. A 1gall. cream can is recommended for use in summer for the farmer owning two cows and sent to the factory two or three times a week to overcome receiving second grade butter returns. Under-feeding cows is one of the causes of second grade tests, also feeding on Cape weed. New South Wales produces 82 per cent. of choice grade butter and SouthAustralia only 40 per cent. and 50 per cent. second grade. Three to four days should elapse before sending a newly calved cow's cream to the factory. One teaspoonful of sulphate of iron is suggested for a heifer whose milk is continually tinged with blood. (Secretary, L. S. Davis.)

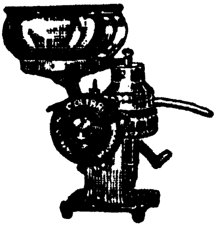
GREENOCK AGRICULTURAL BUREAU.

SECOND ANNUAL REPORT.

[HAROLD E. WILKSCH, Hon. Secretary.]

[The full publication of a Branch annual report is a departure from our usual practice. The following, however, is of exceptional merit, reflecting great credit on its compiler (Mr. Harold E. Wilksch), and it is published as an illustration of a comprehensive and carefully prepared report of a year's operations of a worthy Branch of the Agricultural Bureau.—General Secretary.]

Mr. President and Gentlemen: The past year has been a very busy and successful one for the Branch, as this review of the major happenings will show. The year began with the annual meeting, held on July 6th, 1931, when the following officers were elected:—President, Mr. C. Werner; Senior Vice-President, Mr. B. Braunack; Junior Vice-President, Mr. A. Schubert; Hon. Secretary and Treasurer, Mr. H. E. Wilksch; and Assistant Hon. Secretary, Mr. M. Tregilgas. These gentlemen, with the addition of Messrs. R. Radford and W. Nenke, formed the personnel of the committee. Mr. C. Werfel was chosen as auditor. The Assistant Secretary, Mr. Tregilgas, later left the district and Mr. C. Wilksch was elected to fill the vacancy.



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Twelve Branch meetings have been held, the concluding meeting being conducted on June 27th, 1932. The roll at the last annual meeting showed a membership of 48. This Branch has taken a leaf out of the books of other successful Branches, who periodically revise their rolls and if it is found that a member, for no reason other than lack of interest, has absented himself from a number of meetings, his name is struck off the roll of membership. The following of this policy has not, as might have been feared, had any injurious after effects, for although nine members were lost (this number includes resignations and departures from the district), a number of new members have been gained. During the year 11 names were added to the list of members, the membership now being 50. The average attendance at meetings, which last year stood at the fine figure of 32, has been slightly bettered, an increase of one bringing this year's average to 33. The following members have attended every meeting:—Messrs. C. Werner, W. Nenke, A. Schubert, E. Keller, H. Helbig, C. Wilksch, B. Braunack, J. B. Helbig, E. Zimmermann, and H. E. Wilksch. The last four gentlemen named have completed their second year without missing a meeting. The retiring President has given a fine lead by occupying the chair at every meeting, thus following the example of his predecessor, Mr. Radford. Members have behaved with commendable orderliness, and the business at meetings has been dispatched without hitch or hindrance —a spirit of harmony prevailing throughout. The committee has held two meetings, and on several occasions matters of main importance have been dealt with at the conclusion of ordinary Branch meetings.

The outstanding event of the year was the recently conducted Vine Pruning Competition. The fact that immediately after the last annual meeting Mr. P. Obst of this Branch won the Lower North Vine Pruning Championship Cup presented by the Royal Agricultural Society no doubt gave an impetus for conducting a competition in this district. At the competition held in Mr. C. Schultz's vineyard, Messrs. C. R. Helbig, J. B. Helbig, and A. E. Helbig, in that order, were successful in qualifying to compete in the Championship Contest, and, as the result of gaining second place for fruit tree pruning at the Light's Pass Competition, Mr. J. B. Helbig also represented the Branch in that section of the championship. Messrs. C. R. and J. B. Helbig are to be congratulated on securing second and third places in the championship for vine and fruit tree pruning respectively. As Secretary, I should like to thank members of the Pruning Competition Committee for their hearty co-operation in connection with the competition, particularly the Assistant Secretary, whose assistance in his official capacity I have very much appreciated.

An excellent and varied programme has been successfully carried out, and the interest of members has not waned. In this connection, it may be mentioned that some of the meetings have been as successful as any yet held by the Branch. We are indebted to the Chief Dairying Instructor (Mr. Barlow) for his valuable address on "Ensilage." In giving us a paper on "Poultry," Mr. A. Milway, of Light's Pass, rendered a much-appreciated service, and sheepowners have commented on the value of the address on "Sheep and Wool" delivered by Mr. W. Scott, of Truro. The District Agricultural Instructor (Mr. W. Johnston) has, in the past, gone out of his way to serve the Branch, and this year, in acceding to our request for an address on "Varieties of Cereals Suitable for Average Years" he imparted information that farmers were very anxious to obtain. Mention must also be made of the help received from Branch members. Mr. J. Clarke, in a paper on "Teeth of Horses," gave material for an instructive discussion, and the paper on "Bee Keeping" by Mr. E. Keller showed that the writer was thoroughly acquainted with all phases of the subject. Mr. Braunack's paper on "The Management of Farm Horses" was discussed with an enthusiasm that was, perhaps, unprecedented so far as meetings of this Branch are concerned, and the Secretary's address and demonstration on "Vine Pruning" was given to a large and attentive audience. It was evident that much thought had been bestowed on the seasonal reports, which the following members wrote on the respective topics:—"Livestock," Mr. B. Braunack; "Grapes," Mr. A. Schubert; "Fruit," Mr. R. Radford; and "Cereals," Mr. W. Braunack.

A number of members have represented the Branch at Conferences, and reports on the proceedings thereat have been duly given. Mr. W. Roennfeldt and the Secretary attended the Annual Congress, and at the Central District Crop Competition Conference the President and Mr. W. Roennfeldt acted as delegates. The last-named gentlemen also represented the Branch at the Conference of fruitgrowers in the non-irrigated areas, and again, in conjunction with the President, at the Conference of Lower Northern Bureau Branches. Mr. H. Helbig was our representative at the Pruning Competition Conference, and the President and Mr. E. J. Helbig acted in a similar capacity at the Haygrowers' Conference. The trip of inspection to the Roseworthy College in November of last year was an unqualified success. At the following meeting of the Branch the Secretary reported on the visit for the benefit of members who were unable to take part in the outing.

Through the agency of the District Agricultural Instructor, samples of lime were analysed some time ago and very satisfactory figures were obtained. Mr. W. Roennfeldt is conducting fertiliser tests on grape vines, pastures, and stubble ground sown to cereals. The experiments are carried out in a systematic manner and provision is made for checking the residual effects of fertilisers. This is a vital factor in determining their economic value. A number of other experiments are being conducted by different members, and the information gained therefrom will, in due course, be conveyed to the Branch.

It will be seen that a very profitable year has been spent, and we may well pride ourselves on what has been accomplished. We confidently enter our third year, knowing that we have a band of members who are one in their desire to further the interests of the Branch, for they realise that from the social side alone they are receiving their money's worth, and as a hard business investment their membership is returning dividends that the depression cannot affect. Considered from every aspect the Greenock Bureau can now be classed as a soundly constructed, welded, and tested link in the chain of Branches of the Agricultural Bureau of South Australia.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Upper Wakefield	11/8/32	12	Discussion	C. Neumann, Halbury
Rosedale	16/8/32	14	Papers—"Milking Machines," H. Hoffrichter; "Breeding and Weeding," S. Sincock	H. Muegge
Owen	17/8/32	160	Annual Social	M. Freebairn
Nantawarra	11/8/32	9	Annual Meeting	W. Hamdorf
Wasleys	11/8/32	23	Address—C. Callaghan	C. Currie
Black Springs	10/8/32	9 and 19 visitors	Wool Demonstration—H. Thomas	K. Dunn
Balaklava	22/8/32	7	Address—W. C. Johnston	R. Herriot
Brownlow	17/8/32	19 and 16 visitors	Debate	F. Roocke
Snowtown	19/8/32	8	Question Box	A. Hocking
Greenock	22/8/32	39	Lantern Lecture	H. Wilksch
Penwortham	21/7/32	6	Annual Meeting	A. Jenner
Light's Pass	29/7/32	All members	Smoke Social	C. Verrall
Riverton	19/7/32	—	Lantern Lecture	O. Longbottom
Tarlee	27/7/32	18 and 120 visitors	Annual Meeting	C. Kelly
Wirrilla	16/7/32	18	Annual Meeting	H. Schunke
Truro	8/8/32	11	"Pigs," M. Fohl	L. Davis

YORKE PENINSULA DISTRICT.

(TO BUTE.)

BRENTWOOD (Average annual rainfall, 15.44in.).

June 2nd.—Present: 15 members and seven visitors.

AFFORESTATION.—The following paper was contributed by Mr. E. Carmichael:—"This is a subject that, on first appearances, does not hold much interest for Yorke Peninsula farmers, as commercial forests are not likely to be a payable proposition owing to climatic conditions, and, on the other hand, there appears to be an abundance of firewood to supply the Peninsula for years in the unimproved land. Taking a far-sighted view, a vigorous policy of afforestation is necessary. Viewing the wholesale depletion in timber, and that chiefly in the most valuable native timber, during the 50 or 60 years of settlement in the district, it is evident that within the next hundred years, especially if there is a large influx of population, following the discovery of oil, firewood will become a scarce commodity. Disregarding commercial forests as unpayable, there are three features of afforestation that should appeal to the landowners of the district. They are domestic plantations, field plantations, and management of existing uncleared lands. Domestic plantations consist of trees planted around the farm buildings and the homestead, for the purpose of providing breakwinds and shelter for stock and as a very effective aid in beautifying the home surroundings. Nothing looks worse than a homestead devoid of trees; it looks bleak and uninviting. Here an immediate policy is necessary in many cases. It is a relatively simple and cheap matter to plant a few young trees—say a half-dozen a year—around the homestead. The species recommended are pines and gums. The *Pinus insignis*—while not a commercial tree in this district—makes an excellent breakwind when planted as a hedge, while other ornamental types of pines can give a picturesque touch to the homestead. However, the breakwind should not be overdone, otherwise the house and yards are likely to become a furnace in the summer. A little further afield, around the stables, etc., gumtrees are most useful; the sugar-gum does well and gives a large amount of shade, besides providing useful timber for posts and rails. In this section can also be included the planting of fruit-trees. A small garden of from 10 to 20 trees, containing a fair variety of fruits, can make a great difference to the living at very little expense. Even if the trees are not so long-lived as in gardening districts, the farmer who plants a small garden for his own use is well repaid. But such plantations will not cover the shortage that will eventually occur in regard to firewood and fencing posts. I recommend the planting of small paddocks with some native timbers. Such indigenous timbers as the sheoak, mallee, and peppermint should be planted not only to preserve our native timbers, but because of their value as fuel, and with the introduction of wood-gas tractors, that value will rise. A small area fenced off in a corner of a paddock and liberally strewn with boughs containing the seeds of these should be all the labor necessary. Given normal climatic conditions a fine clump of trees should be the result, and thus there should be an abundant supply of firewood, posts, rails, sulky shafts, etc., for the rising generation. It is surprising how the despised myall has had its potentialities overlooked. For strength and durability myall posts are supreme. Farmers in the Middle North are importing these posts for fencing purposes. An acre or two put down to these trees should obviate the necessity in this district. Even the swamp ti-tree has its uses for thatching sheds and for garden fences, and this, too, is being thinned out. Some attempts should be made to plant a few on some of our swamp areas. The planting of stands of timber seems to be useless in a district which has so many patches of scrub dotted haphazardly over the landscape, but quite a number of these are useless, for they are situated in cultivation paddocks and are so much waste ground. Such patches should be cleared right out, thus making straighter working for the team, and utilising the waste ground. Where the patches are large enough or conveniently situated, they should be fenced off and used as feed paddocks, or the smaller reserved for firewood supplies. Used for feed paddocks, they should be thinned out if too thick, all the small bushes and fallen timber removed, and the intervening spaces top-dressed. But it is evident that scrub lands used for stock agistment will in time become depleted, and so the necessity of reserving areas for the wood supply is necessary. Finally, let me say a word on behalf of the ubiquitous boxthorn. Planted as a hedge it will do away with the payment of Customs charges on fencing-wire, for a boxthorn hedge is absolutely stockproof and foolproof. In fact, the only things that can go through them are rabbits and sparrows. It is an excellent breakwind, and is a good firebreak." (Secretary, G. Tucker.)

SOUTH KILKERRAN.

Present: four members.

Mr. E. Dutschke read a short paper, "Care of the Horse".—To keep a team of 10 or 12 horses in good working condition takes a great deal of time, labor, and study. To get the best out of the horses find out in which position they work best and take good care of them. Keep the stable clean as well as the animals. Some of the most important articles are a good brush and currycomb. When the team is working, brush them down every morning, special care being taken of the shoulders. Sore shoulders are usually due to one of the following:—Collar with draft too low, collar too tight, dirty collar or dirty chin, uneven chains. See that the collar fits correctly and the bearing surface of the collar on the shoulder should always be cleaned, sweat and dirt will soon gall the shoulder. It should be possible to work from 7.30 a.m. to 5.30 p.m. with 1½ hours for dinner. Keep the team at a good even pace and they will do more work than if worked from daylight until dark. With the exception of harvest and seeding, have the team in the stable a quarter hour before sundown, so that the sweat will dry off thoroughly. A whip does not work wonders upon a horse that it is supposed to, it very often only frightens him and makes him angry, although a whip is necessary at times. Every animal must be approached and controlled in a different manner, always speak to them when moving about amongst them, be kind to them, and the animals will respond to kindness. Horses are designed to work, and daily labor for them is necessary. It is not always hard work that wears out the horse, but the rough and inhumane way they are treated. (Secretary, R. E. Hasting.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Paskeville	16/8/32	16	Discussion	J. Prouse
Weavers	10/8/32	10 and 120 visitors	Addresses—A. J. Cooke, H. B. Barlow	H. Cornish, Stansbury
Wauraltee	19/4/32	9	" Rainfall," A. Mitchell .	M. Newbold
Wauraltee	17/5/32	8	Discussion	M. Newbold
Wauraltee	22/6/32	8	Address—R. Hill........	M. Newbold
Wauraltee	26/7/32	10	Annual Meeting	M. Newbold

WESTERN DISTRICT.

ELBOW HILL.

May 17th.—Present: Eight members.

Fruit Trees and Vines.—Mr. S. Hausler read the following paper:—"The collected branches of science, which horticulture and viticulture cover, are of such dimensions that it would be impossible to deal adequately with their many and varied aspects this evening. The first point to receive attention is the selection of land suitable for planting the trees or vines. Endeavor to plant the young trees in soil which is naturally fertile and well drained. Gentle slopes are suitable, as are also moisture holding alluvial soils and sandy loams. If planting on virgin soil clear thoroughly, paying particular attention to removal of roots and stumps, as these harbor insect pests. It is advisable to crop this plot the first year. Do not starve the fruit garden on poor soil merely for the sake of having it close to the house. Having selected and cleared the garden plot thoroughly as a part of the initial preparation, break the surface of soil by use of a garden plough. Where the surface has an underlying stiff subsoil it is advisable to break to a depth of at least 10in. in order to enable roots to strike out freely at a depth where severe heat and cold are not rapidly felt. The selection of suitable trees is a very important point. The most suitable varieties for this locality are the fig, almond, pear, quince, plum, mulberry, and almost all varieties of grapes. Where irrigation is possible the apricot, apple, and peach would flourish if planted in light, deep clay or sandy loams where natural or artificial drainage was satisfactory. These are the kinds which are suitable, but equally important is the particular tree selected. It is advisable to obtain trees from a reliable nursery and, if possible, to select it personally, choosing one well-worked on a suitable healthy stock, having no dead wood, a well trained, clean, straight stem which should be well rooted. Refrain from selecting large nursery trees, rather choose those of one season's growth only. The planting of the tree should be done in early winter when the soil is still warm, although the grape vine may be successfully planted in middle winter in this locality. Before planting, cut back broken roots to a healthy tissue and remove all fibrous roots which show a tendency to shrivel. All roots may be cut back to a few inches. In digging the hole in which the tree or vine is to be planted do not go beyond depth of initial cultivation, and have the bottom of hole for fruit trees sloping up towards the centre. Plant tree at original nursery depth—this is easily ascertained by an observation of the stem. Keep surface and subsoil separate and replace correctly. When planting, spread roots out evenly and have them sloping downwards with the strongest root facing the prevailing winds. Mix about 1lb. of bone dust with soil for fruit trees, one handful for grape vine cuttings, and have whole mixture loose and friable, press this down firmly around roots and put in support stake before filling the hole. The support stake is of use for determining the location of tree during tillage operations. Dig a circle a yard in radius around the tree when planted and fasten to stake with string. Do not tie string around the stem of the tree. Should the owner of the garden be desirous of cultivating his orchard by using implements, it would be advisable to plant trees or vines in squares, as this enables him to crosswork his orchard successfully. The dimensions of squares—which should be suitable—would be 20ft. for fruit trees and 10ft. to 12ft. for vines. Fence the garden in securely, even to the extent of making it vermin-proof. Particularly is this important in the early growing stages, when the tree needs every attention. In a similar manner refrain from allowing stock to play havoc with the shape of the trees and vines, even if the feed around the edges of the orchard or garden does appear to be wasted. Always take a pride in the garden; endeavor to improve its appearance and productiveness, and this feeling of pride may lead you to plant a row—or several rows—of evergreen trees along the side from which the most destructive winds blow, to serve as a break-wind. Olive trees would be suitable for this purpose as they provide excellent shelter, require little or no attention, present a pleasant appearance, and should return a small profit if marketed. The next step is to carefully tend the growing trees or vines through their infancy, because trees may easily be permanently ruined if trained in the wrong way. Bear this in mind when proceeding with the initial pruning, for it is this first pruning which counts, and it may, if carelessly performed, seriously mar the appearance and productiveness of the trees during their life. Methods of pruning vary considerably, and several correct methods may be adopted. The first pruning of trees should be done in winter while the tree is dormant. When pruning a young tree aim at a bowl shape, commencing from the main stem about a knee's height from the ground. Three buds are sufficient to leave, and these should run downward from the cut you have just made. These three buds will produce three shoots for the following year, and will set the foundation for the bowl shape, which you should be aiming at. In the pruning to follow, observe closely the following simple directions:—(1) Always cut close to a lateral or leaf bud and see that the bud which you expect to produce a shoot for the following years points in the desired direction, *i.e.*, towards the outside. (2) Remove cleanly all broken or dead wood, also cross branches. (3) Treat each cut as an injury which you are trying to heal without a trace of the original wound. When cutting away wood which is not required from the main stem, cut very close and clean, and the skin will grow over the wound. If, on the other hand, you cut carelessly, leaving a small stump, you will, besides marring the general appearance of the tree, present white ants and fungi with an excellent avenue through which to work. Observe closely these simple rules when pruning in subsequent seasons, and always prune about July, when sap is dormant. In summer pruning the only growths which should really be removed are water-shoots arising from the bottom of the tree or vine. These are easily detected and should be speedily and cleanly removed, as they do not bear fruit but extract food which should be directed to more useful channels, *i.e.*, the fruit-bearing stems. Vines may be lightly topped in early December, the effect of this process being to divert the sap to the useful wood and fruit. Topping these branches also increases the growth of second crop. Where foliage is very dense—to the extent of screening fruit—it may be advisable and necessary, in cool and wet ripening periods, to remove over-hanging leaves so that the fruit may obtain the full benefits of exposure to the sun and wind, thus hastening ripening and decreasing the danger of fruit becoming mouldy. Trees and vines should be cultivated either by hand or implement after each soaking rain. Weeds or foreign growth of any description should never be found to any great extent in a careful gardener's orchard or vineyard, for, besides stealing valuable moisture they assist in harboring insect pests and diseases which readily attack the fruit trees. To those who have seedless varieties of vines—currants and sultanas—a few words on cincturing may be helpful. This is done to check the flow, and by so doing to induce fruit to set more readily. The best time to do this is when the flowers have just blossomed, generally November to December. The method which is generally adopted is to make two very thin, clean cuts with a sharp knife around the main stem about 1/32in. apart and remove the bark in between these cuts. These cuts should not be made into the wood. If these directions are rigidly adhered to the cut will heal in a month and the temporary check of sap will result in a more satisfactory setting of fruit than would otherwise have been the case.'' (Secretary, W. Cooper.)

KYANCUTTA.

June 7th.—Present: 11 members.

The meeting took the form of a Question Box. "Foot rot and how to distinguish it." The general opinion was that foot rot was mostly confined to marshy and wet country, and there should be very little danger of it appearing in these parts. The next question was the best method to kill barley grass, and the replies given all favored ploughing it in and harrowing when convenient. The remaining question asked was: "What is the most suitable depth to fallow, and what is the most suitable implement to use. After a lengthy discussion it was the opinion of most of those present that from 2ins. to 3ins. was deep enough and that a plough was most suitable, and that every farmer should use his own discretion and use the method most suitable for his particular class of land, as the soil varied so much in this district. (Secretary, J. Dyke.)

LAURA BAY.

May 10th.—Present: 15 members and six visitors.

Bacon Curing.—The following paper was presented by Mr. H. Dixon:—"Winter is usually chosen by farmers for home-curing bacon. The weather should be studied carefully before killing—settled, cool weather being indispensable. Bleed the pig well and give the carcass a quick scald. Three parts boiling water to one of cold makes a good scald. Remove the meat from the water as soon as possible after scalding. When cleaned, hang up for at least 12 hours to cool. When cutting up, first remove the back bone and ribs, cut off the ham and trim, cut the sides in suitable pieces, and the shoulder as small as possible. For dry pickling take 1½lbs. brown sugar, 2½lbs. salt, 4ozs. saltpetre for every 60lbs. meat. Rub the mixture well into each side of the meat, put into a box or cask skin side down, and leave for 24 hours. Take out and throw away all liquid and replace the meat by putting bottom pieces at top. Repeat for a week, then turn every other day for two weeks, when the bacon should be cured. Take out and soak in clean water for eight hours, hang up to dry, rub in a little salad oil with a cloth, and hang in a cool smoke of sawdust. The sawdust must not blaze. A little saltpetre sprinkled on the sawdust gives the bacon a nice bright appearance." (Secretary, W. Edson, Ceduna.)

June 14th.—Present: 12 members and eight visitors.

Mr. F. Edson read the following paper on "Farm Management":—"The management of a farm should start from the beginning. If a man selects a new farm it would be wise to take a day or more, if required, to go over the farm and choose a suitable place to erect the house and sheds, which should be as near the centre of the block as possible. If water conservation is to be considered, it would be wise to select a place in comparatively low ground, so that all tracks leading to the homestead will constitute water runs, but at the same time the house and sheds should not be on a flat place or water will lie around the buildings. The next important step is the laying out of the paddocks, so that all the fields are handy to the homestead. If the foregoing position can be secured, there will be a good supply of water near the homestead, minimising the labor in looking after and watering of all stock, and all paddocks being handy home, the stock are always easy to procure when wanted and kept under observation if required, as well as easily accessible for working. Good fences make good stock, thus saving a lot of anxiety and work. If the fencing is for large stock, erect a fence that can be easily converted to a sheep fence, because a farmer should get a few sheep as soon as he can to cope with surplus feed and for rations. The fence for great stock should be 3ft. 9in. high, with the barb on top of the post, the next wire 14ins. lower, and the next 11½ins. under that wire, for a three-wire fence. Then to convert it to a sheep fence, two wires underneath and one between the second and third wire makes a good sheep fence of six wires; starting from the bottom, the first wire would be 7ins. from the ground, the next from that 5½, next 5½, then 6ins. and 7ins., and the barb 14ins., making a sheep fence 3ft. 9ins. high. The erection of buildings is a matter of means. If it can be managed, build stone buildings as much as possible. It is a common practice to build sheds with forks and rails, but white ants and grubs soon destroy the timber and the stock bump them loose and break them and they are constantly out of repair. The house should be on the side that the heavy winds come from, so that it will not get the dust from the sheds and stock. In the busy season all horses should be fed by 6 o'clock, and if given an hour's feed for breakfast, should be fit for work, with an hour's feed for dinner, a small feed when they knock off, then fed for the night." (Secretary, W. Edson.)

MILTALIE (Average annual rainfall, 13.59in.).

May 21st.

Mr. H. Jacobs read the following paper on "Gardening":—"Gardening, whether it be for fruit or vegetables, can be conducted successfully in this district. With a comparatively low rainfall such as we have, to plant a fruit garden we must select a site which is most sheltered from the south and easterly winds, with a soil that has a loose or sandy top, with a clay subsoil. This ground should be well-ploughed and worked down to a fine tilth one year before planting the trees. With from 15 to 20 dray loads of stable manure to the acre worked into the soil, and a good rabbit-proof fence around the orchard, the trees can be selected and planted. Obtain the trees not later than the first week in July, so that they will be in the ground and rooted before the warm weather comes, or the sap begins to rise. In planting, if the plot is not a good square shape, draw a line through the centre, measure off the number of rows it will take, and then, with a piece of light wire, of the required distance, plant the trees 24ft. apart on the square system. Cut pegs enough to peg every hole, measure off the whole plot, and peg. To plant the tree remove any damaged or broken roots, also cut back the top limbs, leaving three, if possible, branching out around the main trunk. Do not dig a deep hole; 1ft. is ample, with the soil below well loosened. Do not plant the tree deeper than it was when it came out of the nursery ground. If the soil is at all dry, give not less than a bucket of water. This having been done, with good cultivation the tree should take root and grow without any more waterings. Once the tree has rooted, the two most important jobs are pruning and cultivation. If the farmer has had no experience in pruning, get assistance from a gardener, or a very good book is available written by Mr. Quinn on that subject. Start the main arms about 18ins. from the ground. This will give room for the cultivator to get in close and keep the fruit crop low. Give the tree a cup shape, leaving plenty of space in the centre. Prune a very vigorous tree lightly and a weak tree heavily. Remove any fruit until the trees are well established. This being a dry district, spraying is not necessary as in the wetter districts, but sometimes curf leaf appears. For this disease spray with Bordeaux or Burgundy mixture when the flower buds show pink. Time and money is well spent in having a garden. One has the fruit as a reward, and a well-kept garden adds value and appearance to the farm." (Secretary, G. E. Smith.)

MOUNT HOPE.

June 21st.—Present: 10 members.

AFFORESTATION ON THE FARM.—The following paper was given by Mr. J. Vigar:—I have always been an advocate of tree planting, and have endeavoured to do a little every year. The Woods and Forest Department is the best place to procure trees, the trees from this source are certainly the lowest in price, and the Department sends out good healthy trees, equal to those which may be purchased elsewhere. For the red loam soils, with a clay subsoil, which is commonly known as heath country, the South Australian red gum stands alone; it is certainly a fairly slow grower, but it is very hardy, and is sure to come away, and do well in the first year if given equal treatment with the sugar gum, which tree I give second place. The commercial value of the red gum is unsurpassed by any other hard wood which has ever been tried in this district, and the foliage, from its early years of growth has a pretty drooping habit and always gives a beautifying effect to the landscape, and also a cool shade for stock. The red gum should never be planted too close; give it room to spread, not less than 30 feet space. The sugar gum has given satisfaction on our heath country, and is worthy of a place. The native pines also do well, and I recommend these for planting in preference to the imported types of pines, which have never done well. As an ornamental tree the almond should have more preference. It has been planted in some farms, and when given fair treatment, has proved itself suitable for the country. As an ornamental tree it is beautiful, although not attaining the large growth of the pines and gums. Its monetary returns each year should make it attractive. All other types of trees which have been tried have not given satisfaction. On the coast type of country, which has an overlying soil of light grey loam, the subsoil being chiefly white sea sand, and in some places limestone rubble, the Sheoak is worthy of note, and settlers should give more attention to its growth. If small paddocks are securely fenced, the young Sheoaks will grow from seed and do well. The dwarf gum will do equally as well as the Sheoak, it is a fast grower, and will help towards beautifying the coast lands. Both the above varieties must be protected from rabbits. I have both the red gum and the native pine growing, and although growth is somewhat slow, present prospects are that they will be large healthy trees when the Sheoak and Dwarf gum which were planted at the same time will have ceased to exist. The Tamarisk is a tree which has proved to do well on our coast lands, and if cuttings are now taken, and placed in sandy soil, they will readily take root. The Norfolk Island pine appears to do well where it has been planted. The carob is a tree I am expecting good results from; although only in its second year, it is doing well, and the sea wind has not appeared to affect it. The present seasonal rains have been good, and I hope all Bureau members will send away for their catalogues from the Woods and Forest Department, and do a little afforestation work as soon as seeding operations are completed. (Secretary R. Speed.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Pygery	16/8/32	13	Discussion	A. Day
Laura Bay	9/8/32	18	Question Box	W. Edson, Ceduna
Balumbah	31/8/32	—	Address—H. D. Adams	A. Jericho
Koppio	5/7/32	12	Paper—"Lambs for the Freezers," W. Cooper	M. Gardner
Smoky Bay	6/8/32	12	Annual Meeting	K. Harrison
Kelly	20/8/32	21	"Starting a New Block," G. Cant	I. Grund
Kyancutta	19/8/32	12	Discussion	J. Dyke
Goode	20/7/32	18	Annual Meeting	B. Linke, Ceduna
Palabie	15/7/32	12	Annual Meeting	L. Miller
Palabie	12/8/32	4	Formal	L. Miller
Cungena	4/8/32	12	Question Box	A. Voumard
Cleve	9/7/32	8	Annual Meeting	A. Preiss
Streaky Bay	15/7/32	7	Address—Cawte	J. Drever
Kyancutta	2/8/32	20	Annual Meeting	J. Dyke
Lipson	21/7/32	11	Address—H. B. Barlow	M. Barraud
Petina	26/7/32	—	Discussion	W. Stone
Elbow Hill	12/7/32	12 and 31 visitors	Address—H. B. Barlow	W. Cooper
Cummins	13/5/32	8	Discussion	H. Roberts
Cummins	17/7/32	8	Addresses, H. B. Barlow, H. D. Adams	H. Roberts
Wallala	—/7/32	11	Annual Meeting	C. Zippel
Taragoro	14/7/32	8	"Fallowing," A. Edwards	T. Winters, Cleve

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

COOMANDOOK (Average annual rainfall, 17.22in.).

June 30th.—Present: Seven members.

FALLOWING.—The following paper was read by Mr. W. R. Trestrail:—"Now that the farms in this district are getting into good working order, and in most cases becoming free from stumps and the biggest of the stones picked up, more attention can be paid to fallowing. The chief difficulty in laying down any one method is the number of types of soils found on the average farm in this district. Even in a 200-acre paddock several types of soil, ranging in some cases from black, sticky clay soils (when wet) to white drift sand, will be noticed. Strictly speaking, each class of soil needs a different working to ensure best results, but this cannot be done when the soils are so patchy, and all that can be done is to work on a general scale. The problem of stony soils in this district always presents a big difficulty, because the more they are worked the more work they make by bringing more stone to the surface. However, taken as a general average, the soils of the district can be classed as sandy loam, with occasional sand rises that require careful treatment with regard to fallowing so that they do not drift. The correct method of handling sandy soils is becoming a question of the utmost importance in South Australia, because in all of the comparatively low rainfall country a fairly large proportion of the soils is of a sandy nature. These soils are, generally speaking, easy to clear and to work. Also in their virgin state they were offered on very reasonable terms by the Government and men with limited capital and stout hearts and arms were afforded an opportunity of taking up the vocation of farming. To derive the best yields from the land it is necessary to fallow. Not half the wheat grown locally is produced on fallow, hence the small returns of recent years. Fallowing is not a new method of farm practice. It has been in use for hundreds of years. The

Roman farmers used fallow to increase their wheat yields. The pioneers of farming in all countries of comparatively small and uncertain rainfall soon discovered that continual cropping was unprofitable owing to the depression of the yield. The benefits of bare fallow were soon discovered, and this system gained a firm footing. Under Australian conditions it is definitely stated that to obtain wheat crops where the annual rainfall is below 20in., bare fallow is necessary. The outstanding advantages of bare fallow for grain growing are as follows:—(1) It conserves soil moisture; (2) it increases the available plant food in the soil; (3) it ensures a clean, firm seed bed; (4) it distributes farm work more evenly throughout the year; (5) it controls weeds; (6) it leads to increased wheat yield, especially if there be a dry spring. (1) The sun is ever drawing moisture from the soil, and the wind also dries out moisture. The fallowed land acts as a shade in keeping the sun's penetrating rays from searching from the deeper soil the stored moisture. This may be termed a mulch of fine soil that is the result of the land being stirred up, pulverised, and partly set. The water that passes through this top layer of fallowed soil is very much slower in evaporation. Slight stirring of the soil after every rain is so important to conserve moisture (2) This follows on the first point. The soil is full of bacteria. The conserved moisture creates favorable conditions for the growth of bacteria, which require a favorable temperature, sufficient supplies of soil moisture, sufficiency of air in the soil, and the presence of a base (lime or gypsum) to combine with a nitric acid formed. All these conditions are found in well worked fallow. This is one of the most important factors in the production of the bigger yields of wheat. This point is often overlooked, moisture and air producing a nitrogen or plant food for the coming crop. In Victoria tests have been made and the amount of nitrate nitrogen formed in fallowed and non-fallowed soil to a depth of 5ft. in typical Wimmera soil is as follows:—Fallowed land, 91.9lbs. nitrate nitrogen per acre; non-fallowed land, 21lbs. nitrate nitrogen per acre. Locally it is not possible to store that quantity of plant nitrogen, because the soils have not that depth of earth, but unquestionably the land derives much benefit in making available more plant food for the plant. A 15bush. crop of wheat requires 21lbs. of nitrogen per acre. (3) The District Agricultural Instructor (Mr. R. L. Griffiths) never tires of making this point plain to mallee farmers. It is one of the problems in sandy soils to form a firm seed bed. To attain this is not the matter of a week or two or one or two workings. Judicious cultivation, rain, and sheep are necessary. No mallee farmer can possibly afford to be without sheep; they assist very materially in a consolidated seed bed. That is why the sowing of oats is often recommended on drifty soils at time of fallowing, so the sheep will pack the soil, while the oat plant will also bind the land. Soil likely to drift cannot be worked or made smooth, because it will probably cause trouble if high winds are experienced. To obtain a clean seed bed, weed seeds must be allowed to germinate and be killed, and this takes some time. (4) Bare fallow distributes the work of the farm more evenly throughout the year. Successful farming entails a close application to detail. Preparation of the seed bed and the sowing at the right period of the year are very important. Bare fallow enables the farmer to spread his work more evenly throughout the year. Rush periods and long hours with a tendency to slum work are abolished. Hasty ploughing, followed by the seed drill or combine, means a poorly consolidated seed bed, dirty crops, and poor yields. Summer fallowing should commence after harvest should a good rain fall, and winter fallow as soon as seeding is finished. In this district it is not wise to work the fallow too much before harvest, but if summer rains fall use every favorable opportunity to work the land, kill weeds, and consolidate the seed bed. (5) Fallowing helps considerably to control weeds. Each time the soil is worked the weed seeds are brought nearer the surface where they germinate. Most weeds require air as well as moisture to cause growth. This is what is done each time the land is harrowed or cultivated. Never work deeply with the cultivator or all the work is undone. Fresh weed seeds are liberated and the seed bed destroyed. After every rain in summer and autumn, get busy and kill weeds. Sheep, as previously mentioned, are a very valuable asset in keeping fallows under control from weeds. Lastly the aim of fallowing is that of increased yields. One cannot do better than quote figures from the Government Statist that have been recently published, showing the superiority of crops grown on fallow. In a very good season the difference in yields per acre is much less than in less favored seasons, as will be seen by the following tabulation. These figures represent total South Australian yields:—

	Yield per Acre.		
	1930-31.	1929-30.	1928-29.
Grown on—	Bush.	Bush.	Bush.
Fallow	14.31	9.07	10.74
Non-fallowed	7.57	2.84	3.65
Total	11.81	6.40	7.79
Rain, April-November	13.71in.	9.57in.	9.39in.

Of last season's wheat crop 2,385,441 acres sown on fallow yielded 35,325,997bush., averaging 14.31 bush. an acre, and 1,685,929 acres sown on unfallowed land yielded 12,767,105bush., averaging only 5.75bush. an acre, thus making the State average 11.81bush. an acre. Conclusions: From practical experience and facts and figures fallow pays. Fallow early. Use where possible the share plough. Keep weeds down with sheep and with subsequent working, especially if summer rains fall. Be careful not to go too deeply to disturb the seed bed. It pays well to fallow new land, especially if any porcupine was growing in the land previously to the burn. No crop can be successfully grown in this soil until the sourness and the roots of the plant have been ploughed out. Each farmer must choose his own method of working according to the type of soil on his farm. Experiment, and be careful to note and tabulate the results, and this will be a valuable guide in the coming years. (Secretary, W. Trestrail.)

MOORLANDS (Average annual rainfall, 14.76in.).

June 15th.—Present: nine members.

Co-operation.—The following paper was contributed by Mr. R. Nicholls:—"One of the most familiar expressions in the English language is 'Mind your own business,' and no doubt there are many occasions when the remark is justified, either as a rebuke or advice, but if everyone were to concentrate exclusively on minding his or her own business the world would be a very poor place in which to live. The higher and more intelligent animals do not mind their own business, in that sense at all events: they co-operate. Wolves hunt in packs for increased hunting strength, and deer form herds for mutual safety, whilst everyone knows the wonderful co-operative work of ants and bees. Man, the highest animal of all, has attained the state which we call civilisation only by joining with his fellows, and the greatest nations have been those whose people worked together. Co-operative societies have sprung up all over the world, and much has been said and written about the undoubted advantages of co-operative marketing. Co-operation, like charity, begins at home and there are many opportunities for practical co-operation in this and every district in Australia. It would be hard to find a body of men more willing to help one another in time of trouble than farmers, and, when directly approached, they are always ready to explain their methods of production. But there is room for more co-operation in little things, and little things always count. Take, for example, the rabbit pest. It is notorious that a man

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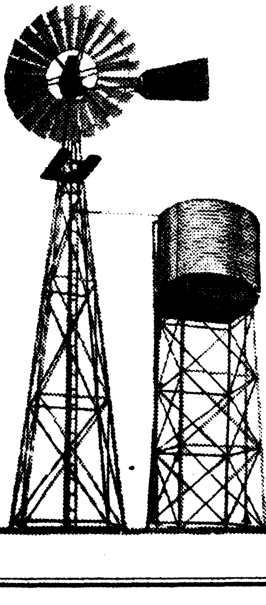

may constantly reduce the number of rabbits on his property and still suffer damage to his crops because his neighbor is not co-operating with him by also setting traps or cleaning out stone heaps. In a recently settled area like this the control of rapidly spreading weeds is almost an impossibility, but where conditions allow, it should be regarded as a public duty to exterminate them. Then there is the very important matter of the boundary fence. No one but a decided optimist would expect a man to carry co-operation to the length of allowing his neighbor's sheep to get fat on his growing wheat. These are only a few of the ways in which local co-operation can be carried out, but the exercise of a little consideration and occasionally putting yourself in the other fellow's place, will discover many more. Practice co-operation on your farm. Co-operate with those about you, treat the team as partners not four-legged machines, and just as you expect the horses to co-operate with each other, co-operate with them by attending to their needs and ailments at the proper time. It is also possible to co-operate with yourself by bringing the best that is in you to bear on your work. Accept the co-operation of others who are waiting and willing to co-operate with you in the Government experimental and instructional departments. These departments are in existence—not for the purpose of finding someone a soft job—but to help you to co-operate with nature and thus get the best out of your land. Last, but by no means least, is that very practical co-operative association, the Agricultural Bureau, which, if properly used, should be as valuable as Roseworthy College. Experience—the hardest but perhaps the most successful of teachers—may show you a better way of doing a thing, and, unless you consider it such a brilliant discovery that you intend taking out patent rights for it, it is up to you to bring it to the notice of your fellow-members—possibly it will save someone pounds. Bring your troubles along as well, providing they are not financial or domestic, because healthy discussion will frequently produce a way of overcoming them. Mind your own business by all means, so far as minding it means attending to it, but remember that co-operation is only an every-day application of the golden rule: 'Do as you would be done by.' " (Secretary, R. Wilmshurst.)

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

June 18th.—Present: 27 members.

Poultry.—Mr. A. Frahn read the following paper:—"Poultry is a very important sideline on the farm because grain put aside for poultry will be profitable throughout the whole year, and contribute considerably towards housekeeping expenses. A good laying strain should be kept. A house built with galvanized iron, bolted on to iron instead of wood, is advised, so that if troubled with lice or tick a fire can be lighted in the house and the vermin destroyed without any harm being done. There should also be a breeding pen or two in every poultry yard, big enough for about 10 hens and one rooster. The fowls can then be penned to get eggs for setting. Drinking water should be changed regularly; if neglected, it is likely to cause disease amongst the birds. Poultry should be fed on pollard occasionally. When feeding with wheat, throw the grain where the fowls have to work and scratch for their food. Green feed, such as cabbage and lettuce leaves or a patch of lucerne will be found very useful. Hens should be penned about June, so that they will be laying for August setting. If penning White Leghorns, Black Orpinton hens will mother the chicks better than the White Leghorns. Poultry should have a good, roomy house, with suitable roosts made with wood. Iron roosts are too cold in winter. Another important point is to see that the birds always roost in the house, not on top of the farm implements and along the back of the horses' mangers. "Clucky" hens, if not wanted for setting purposes, should be taken off the nest and penned until they go off the brood. Eggs should be picked up regularly; it is the stale egg that helps to keep the market for country eggs so low. Poultry houses need special attention and must be cleaned out regularly. When deciding to get rid of surplus or unprofitable stock, pen and fatten them; good conditioned birds always bring the best prices. Turkeys hatched about June will be ready for sale when there is a good demand, but they are more difficult to rear than those hatched in September or October, because then the weather is much warmer." (Secretary, C. F. Altmann.)

PARILLA (Average annual rainfall, 13.91in.).

June 20th.—Present: Eight members.

Fat Lambs.—Mr. J. Wallis read the following paper:—"As a mother for fat lambs the Crossbred ewe may present many advantages over the Merino, but at the present they are not available in any great number, whereas the Merino can generally be secured in an even line and in almost any number. As a mother for fat lambs I suggest a large-framed, long-woolled Merino ewe, the Leicester cross is a good type offering a higher lambing percentage, better shaped, and early maturing progeny, and able to stand wet and cold conditions better than pure Merino. A ewe for this purpose should not be too old, a six-tooth to full mouth being a good age. As soon as the ewe shows signs of teeth failing she should be cast out. Young ewes often prove poor mothers, and if mated to British bred rams lambing losses are much heavier. *Mating*: The selection of a good ram is a very important factor in breeding fat lambs. The Suffolk or Dorset Horn are good sires for early maturing lambs. When mating ewes the number of rams should not be limited, and if possible more than one should be turned in with the ewes as they then work better than if alone. Not more than 50 ewes should be mated to one ram. The ram should be strong and healthy; if either too fat or too low in condition the result may not be very satisfactory. A ram generally becomes slower as he gets older, and should not be relied on after 'full mouth.' In warm weather or when the rams are carrying heavy fleeces, it is sometimes difficult to get the rams to remain with the flock, in such cases it is a good plan to yard the sheep overnight. The ram should remain with the flock from six to eight weeks, and if possible a fresh ram should be added during the last week or two to catch up ewes which may have missed. The ewes should be in good store condition, but not fat, when mating. The ewes should be crutched a month before lambing is likely to commence. As the lamb is a source of revenue close attention should be given to the flock as soon as lambing commences, and assistance given when necessary. Tailing should be done when the lambs are about two weeks old, they then recover more quickly from shock than if older. It also prevents coarseness and staggyness of the wether lamb. It is not a good plan to wait until all the ewes have finished lambing before tailing because some would be much too old. In order to prevent tetanus, tailing should be done in a well grassed enclosure rather than a dirty yard. *Marketing*: Lambs should not be weaned before disposal, but sent straight off their mother. It is essential they carry 'bloom,' and therefore should be grazed on the best of pasture. Hand feeding can never replace grass so far as lambs are concerned. When a lamb is from 14 to 16 weeks old—if given plenty of good feed—it should be fit for market and weigh from 70lbs. to 75lbs. live weight. It is a mistake to keep them until they become too heavy, they often lose their 'bloom' and realise a lower price. *Trucking*: Every care should be taken when trucking. Lambs are very easily damaged, and the use of sticks or lifting by the wool should be avoided as much as possible.'' (Secretary, C. Foale.)

RAMCO.

April 26th.—Present: Six members.

The Hon. Secretary read extracts from a Bulletin, ''Preservation of Posts.''

A further meeting was held on May 16th, when the discussion on the above subject was continued.

PRUNING.—Mr. E. Leishman (District Horticultural Instructor) delivered an address at a meeting held on June 13th. In the course of his remarks, Mr. Leishman said trees were pruned with the object of producing fruit, not wood. Cutting should not be too hard or too much wood growth would develop. It should be the aim to get the tree between strong and weak; weakness went to fruit, strength to wood. Each tree should be treated individually. Pruning of the vine depended on the strength of growth. If growing strongly, the vine should be given plenty to do. He considered competitions along the river had improved pruning. The aim was to establish a standard of pruning on a commercial basis. *Analysing of Orchards by Simple Tree Records.*—The factors in orchard practice that had received the most attention in the last decade were cultivation, pruning, manuring, pest control, &c. The inherent qualities of the trees had received considerable attention during recent years, with the result that more care was given to the selection of stocks and bud wood than was formerly. Beyond the general questions of soil and climatic limitations, however, comparatively little attention had been given to the important matter of orchard environment, and especially in relation to cultural practices. Unquestionably much, if not most, of the wide variations of yields of trees was due to differences in environmental conditions as related to cultural practices and may be overcome partially through an appreciation of this fact by the grower. To determine the relative efficiency of the orchard, a method of analysis was suggested over a period of four years. He believed that its use would do much in indicating the nature of the cause of failure and increasing the production of the average orchard. Most growers thought of their orchards in acres or blocks, but should consider the individual tree was the ultimate unit, a fact not sufficiently appreciated by the average grower. The progressive dairymen would not question the value of herd testing, and the keeping of production records to the fruitgrower was of just as much importance. A simple method must be adopted; elaborate means could not be undertaken without a fair amount of expense. The fact of keeping data of actual tree records had been the principal point in deterring growers from undertaking orchard analysis. By long practice a grower became an expert in estimating the yield of trees in cases. A system which could be adopted was as follows, taking into consideration a normal full crop for the year and divide in the following classes:—(1) Very poor; (2) poor; (3) medium; (4) good; (5) very good. *Estimating on the Basis of the Size of the Tree.*—For all practical purposes three groups were necessary, viz.:—:—(1) Trees failing to make a return equal to the amount expended on their care could be referred to as "boarders" bringing on classes very poor and poor; (2) trees producing sufficient fruit to approximately meet productive costs and not showing a profit could be called "self-supporters" under the class medium yields; (3) those making a return in amount larger than their share of production costs were "profit bearers," class good and very good. In segregating the orchard into those three groups the practical consideration was to determine the causes of consistent variation. Possibly in the majority of cases, low production was the product of environmental factors which might be wholly or partially remedied. In taking those tree records over a four-year period, one would probably find the three classes arranged themselves in groups instead of being scattered here and there. If that was the case it was obvious that one or more general factors were affecting the trees and pointed to environment. Those causes might be possible to correct by means of changes of orchard management, such as draining, cultivation, irrigation, manuring, &c. The information gained by simple orchard analysis would be extremely helpful, and possibly remedy the causes so as to improve the orchard production. Mr. Leishman then answered many questions. He favored multiple furrows in watering orange trees, being better than few furrows for long period, allowing water to sink where not needed. The Washington Navel orange was a bushy tree of pendulous habit, much of the shape of a globe with a thin skin. Off-type was more upright in growth, the fruit having a gross skin and often corrugations at the stem. Thompson's Improved was only improved in the skin, which was thin, and ripened early. It had not the juice nor flavor of Washington Navel, and did not produce many dry oranges. Replying to a query as to manure for vines, he favored super and sulphate of ammonia (3 to 1), and it was preferable to apply half before the first irrigation and the remainder before the end of November. For a single manure sulphate of ammonia gave best results. (Hon. Secretary, J. J. Odgers.)

AILMENTS OF STOCK.

Address by Mr. F J. J. Petch to Alawoona Branch of the Agricultural Bureau.

Sand.

From a good deal of experience and examination I have come to the conclusion that when horses are carrying an unknown quantity of sand, it is better to try and get them accustomed to stable feed and to settle down without having recourse to medicines credited with the ability to shift sand. More sand is moved by extraneous causes than by medicine. Between harvest and seeding is the worst time for horses collecting sand, especially if the crop has any burnt off patches in it. The obvious course is to take horses up before they have become loaded with sand. We cannot, however, always do this for many reasons, so must take the chance. After taking the horses up and beginning to work, it will be found that odd ones will go off their feed, whilst not actually bad. Leave them out of work, and it will be found they will settle down, but may have a slight attack later on. Once the team gets over that stage it will be found that they may go through a whole seeding without sickness, and when turned out on good feed or crop later will get rid of the sand by Nature's process. Carefully note the team and its work, and if any sickness from this cause occurs, it will generally be found that there is a cause for it. Either the team has been hurried the previous day or over-pulled or something unusual has happened. Therefore avoid anything out of the ordinary. It is quite possible to run horses in a stubble paddock and get them loaded with sand, but if left there until green feed comes along there will be probably no deaths. Take them out and shift them smartly for a few miles, and the chances are that the aged horses in the mob will die. What happens is that the unusual has brought about an upheaval in the stomach which has lifted the sand collected there and forced it along the bowels. The small bowels having a greater "capillary attraction" than the large bowels, pass this sand along whilst causing the animal to have violent colic attacks. When this sand reaches the big gut along the bottom of the belly, it collects and the capillary attraction being less, the horse is unable to pass this sand before inflammation sets up and kills him. More sand is moved by other causes than medicinal, and the best way to move sand is by getting the animals out on to good green feed, when the succulent juices will do more than medicines for this ailment. The construction of the horse's stomach is such that it lends itself to the collection of sand and similar matter, whilst cows, sheep, &c., are not so affected. It must be remembered that should horses get so bad that action is necessary, it is worth while to give purgatives—warm water injection, &c., in the hope that the quantity of sand to be moved is less than was thought

WHEAT.

Horses from time to time get access to wheat and gorge until they become ill. If the animals have been discovered before the effect of wheat gorging is noticeable, push them along for a mile or two at a good pace after giving them all the water they will drink. This helps the bowels to pass along the wheat. Look out for symptoms of colic in the early stages and give physic in the shape of 1pt. linseed oil, followed by 4 drams of aloes in a ball. Usually it will be found that those horses which show signs of colic very early after getting the wheat will be those that have got the least quantity and will quickly recover. Look out for the horse that is likely to die unless treated quickly. This horse should be bled from the jugular vein about half-way between the collar and jaw, and about 1gall., or in some cases a little more, taken. For the novice it may be well to say that to bleed a horse is quite simple, and is done in the following manner:—Pass a cord around the neck and tie it fairly tight; clip hair away from the place selected to bleed. The vein will become enlarged when the cord is tied and easily seen. Mark the place right over the vein with indelible pencil and then cut through the outer skin. When the skin goes back, the cut should be right over the vein. Cover a sharp knife with the finger and thumb and pierce the vein in a longitudinal manner. Catch the blood in some article of a certain size as a guide to the quantity. When finished, release the cord, pass a pin through both edges of cut and wind cotton around each end. Next day pull out the pin. Disinfect before and after. Carbonate of soda is used extensively for this complaint, and being of an alkali nature, should counteract the acid gas generated by the wheat. Some farmers think that because the seat of the trouble is the feet and legs, blood should be drawn from the leg. This is not so. The idea is to reduce inflammation and blood pressure as quickly as possible, and this can best be done by drawing off from the jugular. Another advantage is that in the neck the animal is less likely to contract tetanus than the leg. There are two peculiarities of the horse. One is the predisposition to turn cartilages into bone on the slightest provocation and the other is for any general derangement of the system to bring about laminitis or inflammation of the feet. Mares after heavy foaling and horses after extraordinary exertion are subject to founder, and the same treatment of bleeding as for wheat is recommended.

STRANGLES.

This is a disease that must run its course, and is better left to Nature than interference by man. Good food, attention, and good nursing are all that is required, and all that can be given by the ordinary man. Steam the nostrils in bad cases and allow

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Nature to burst the abscess when ready. Premature interference only brings about a sort of bastard abscess which may disappear and form again internally and cause death. Tracheotomy is performed in only very few cases.

MILK FEVER.

This occurs in cows in a fat condition after (generally) the second calf. Conditions predisposing to it are, in addition to fat condition, heavy milkers and easy birth. The trouble usually occurs about 24 hours after calving, but can be much later. The cow staggers and finally goes down and gradually becomes unconscious. No medicine is required. Milk fever outfits are obtainable for about 12s. 6d., but usually are in a perished condition when wanted. A quill from a turkey's feather put in a bike pump is quite satisfactory for inflating the udder. Tie with ½in. tape and take off tapes after cow has got up. On all occasions use plenty of disinfectant both for hands and instruments. This complaint is easily recognisable, easily cured, and can be treated by any man or woman of average intelligence.

PINK EYE IN SHEEP.

This is known fairly generally by the above name, but is contagious ophthalmia. Pink eye is a virulent form of influenza in the horse; sheep become blind and wander off on their own, often in circles, and get away from the mob and become exhausted. The eye is covered with a white or pinkish film. Place all sheep so affected in a small yard and feed with long hay. They will feel this with their feet and will eat more readily than from a trough, which they might fall over several times before finding out that it contains food. Use boracic powder or eye lotion for the eyes and the disease will run its course generally in 10 days to a fortnight.

Mr. Petch then dealt with parturition at some length, and quoted many of his own experiences, and endeavored to show members how easily they could help themselves and neighbors by giving a little wise and careful assistance at this time. Although for cases of malpresentation there were various instruments obtainable for the assistance of the operator, they should never be used except in the hands of very experienced and careful men. Most cases could be successfully dealt with by commonsense and careful manipulation of the human hand and arm, which, after all, for this purpose is one of the finest instruments ever made. Great care and cleanliness should be observed at all times, and all inside work done quickly, but not hurriedly. After malpresentation or a heavy birth it should be remembered that several things could happen. The back bowel may be inverted, the womb inverted, mare may get inflammation of feet, &c. For the other two conditions the animal should be stood with her head downhill, and after carefully washing in warm milk or mild disinfectant and removing all dirt, the rectum or womb should be gently returned. Give a dose of laudanum, and if necessary securely fasten on a "gate" or wire up lips to prevent recurrence. Mr. J. Pengilly asked if there was any preventive for milk fever and would fasting help. No known preventive but fasting for a time, say a few weeks on half rations, before calving, would help considerably. A cow might have it one year and miss the next. Mr. P. Paull had a cow with tongue protruding from mouth, being stiff like a piece of wood. The complaint was known as wooden tongue, caused by a rag-fungus, and the mouth and other parts of the body became hard and ulcerated. A veterinary surgeon should be called in, as this disease was communicable to man, and care should be exercised when dressing. In cattle the treatment was to give ½oz. doses of potassium iodide daily; scrape away the affected parts, and swab with idoine solution (1 in 20).

PARILLA WELL.

Formed on March 13th, 1912, the Parilla Well Branch of the Agricultural Bureau celebrated 20 years' of active work by a social evening in the local hall on Tuesday, August 16th. There was a very large attendance of members and visitors, the chair being occupied by Mr. J. Ferguson, jun. An excellent report, covering the work of the past year, was presented by the energetic and capable Secretary of the Branch (Mr. E. C. Slater), and the Branch owes much of its continued success to the enthusiastic efforts of this officer. Opportunity was taken of the occasion to present Messrs. J. E. and J. W. Johnston, J. G. and G. B. Pahl, A. M. Nordhaussen, and J. S. Ferguson certificates conferring on the recipients the honor of life membership of the Agricultural Bureau, the certificates being handed over by Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau). These gentlemen are six of the foundation members of the Branch, and on receiving the certificates, each spoke of the value of the Bureau to the man on the land. It is interesting to report that Mr. J. E. Johnston, who was the first Chairman of the Branch, has again consented to occupy the chair for the ensuing year. Messrs. A. Bone, H. G. Fewings, and A. Young, of the Pinnaroo Branch, congratulated the members who had received their life membership certificates, and a strong plea was made for the young men of the district to "stick to the Bureau" and take a live interest in its work. A novel feature of the evening was the excellent variety of costumes worn by the dancers, and prizes were awarded for the best sustained character and best "old time" dress, the judging being done by Mesdames Young, Hawthorne, and Mr. Richards. Supper was provided by the ladies, and a most enjoyable evening concluded with dancing interspersed with vocal and musical items.

TAPLAN AGRICULTURAL BUREAU.

FIELD DAY.

Attended by a gathering of 30 members and visitors, and boys from the senior classes of the local school, the Field Day held at Mr. D. R. Hampel's farm on Tuesday, August 23rd, was agreed by all present to be the most successful fixture held under the auspices of the Taplan Branch of the Agricultural Bureau. During the afternoon Mr. P. H. Suter (Senior Dairy Instructor) gave an interesting demonstration on the points to look for when selecting a good dairy cow. The visitors were then entertained at afternoon tea by Mrs. Hampel, after which, in company with Mr. R. L. Griffiths (District Agricultural Instructor) and Mr. F. C. Richards (Assistant Secretary), they inspected some of the crops on Mr. Hampel's farm, which consists of 1,045 acres, all of which are cleared. Mr. Hampel has been on his holding for six years, and has 600 acres under wheat this year; 200 acres being on fallow. Wheats sown include Nabawa, Waratah, Early and Late Gluyas, Gallipoli, and Sultan, the last mentioned being a particularly fine crop, and prospects point to the best harvest since Mr. Hampel has been in the district. His farm average last year was 13bush. to the acre.

Field Day, Taplan Agricultural Bureau, August 23rd, 1932.

Mr. W. J. Hammond (Chairman of the Taplan Branch, and one of the oldest residents of Taplan) has been in the district for 21 years, and is a keen supporter of the Agricultural Bureau and the Department of Agricultue. He believes that whilst the present situation calls for very careful expenditure of public moneys, the Department of Agriculture should be the last of the Government Departments to be unduly hindered in the excellent work which it is doing for the man on the land.

Like many another Branch of the Agricultural Bureau, the Taplan Branch has had its ''ups and downs,'' and much of the credit for holding the Branch together during the drought years, when interest was inclined to lag, is due to the enthusiasm of the Secretary, Mr. P. R. Hodge, of Nangari. He came to the district in 1912, and for two years worked a farm on shares with Professor Angus, a late Director of Agriculture. Mr. Hodge sold his plant and livestock in 1916 to enlist, only to be turned down as unfit for active service abroad, and then continued share farming until 1920. In 1921 he was allotted a scrub block of 1,200 acres, of which 850 acres have now been cleared; 500 acres are under crop this year, the principal wheats sown being 300 acres of Nabawa and Ranee. Present indications are that the season will be one of the best since he has been farming in the district, and with a rain to finish off the crops early in September, and a reasonable price for wheat, farmers will be well on the road to recovery.

Another of the original settlers of the district is Mr. E. H. Schultz, of Nangari, who, with Mr. W. J. Hammond, are the only remaining foundation members of the Taplan Branch. He took up his block of 1,320 acres of scrub land in 1914. At this time the district was not connected with the Loxton water supply, and water had to be carted from Paringa at a cost of 9s. per 1,000galls. This year he has sown 500 acres of wheat, 125 acres of which are on fallow. His favored varieties are Nabawa, Ford, and Gluyas. So bad have rabbits been this year that Mr. Schultz was forced to stop fallowing to deal with this pest, and in the course of eight weeks' trapping 2,000 rabbits were taken off the property and sent to the freezers at Renmark at prices ranging from 2d. to 5d. a pair, and Mr. Schultz said, ''there was good money in them at that.'' In 1929 Mr. Schultz ''banked'' his all on the turn of the season, and had under crop 1,900 acres, but this disastrous undertaking resulted in a return of 32 bags of wheat. He considers the prospects for the season to be excellent, and on present indications expects his farm to average a yield of eight to 10 bags to the acre.

The evening meeting was one of the largest the Branch has ever held, there being quite 150 persons present. Short addresses were delivered by Messrs. Griffiths, Suter, and Richards, and the evening concluded with a supper and dance.

So successful has this form of meeting proved with all Bureaux, that it is suggested that those Branches who have not included a Field Day on the programme of meetings for the year should, with the co-operation of the Officers of the Department of Agriculture, endeavor to do so.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Renmark	22/8/32	9	Annual Meeting	B. Walters
Coomandook	28/7/32	11	Annual Meeting	W. Trestrail
Marama	17/8/32	10	Annual Meeting	T. Hinkley
Nunkeri	21/7/32	11	Formal	F. Ling
Yurgo	26/7/32	11	Paper from *Journal*	M. Walker
Moorlands	17/8/32	13	Annual Meeting	R. Wilmshurst
Pinnaroo	26/8/32	13	Debate—" Wheat Marketing "	H. Badman
Parilla	2/8/32	13	Lantern Lecture— H. Johnston	C. Foale
Lone Gum and Monash	21/7/32	21	Addresses—F. R. Arndt, Severin, and Rice	L. Bigg

SOUTH AND HILLS DISTRICT

MILANG (Average annual rainfall, 14.96in.).
July 16th.—Present: 13 members.

FARM POULTRY.—Mr. W. Yelland read the following paper:—The average farmer of this State does not look after his poultry to the best advantage. The writer recommended them to join an association to help market the eggs, which should be of 1⅞ozs. to 2ozs. for export. The collecting of eggs should not be neglected, and at all times should be packed and graded carefully. Feed first-class food, give clean water each day, and do not force a pullet to lay until five to six months old. The writer recommended White Leghorns for a first-class, all-round bird. He then dealt with the export trade, saying that there were over 68,000 cases of eggs and pulp shipped from South Australia last year, the shipping period being about five months of the year. South Africa was our biggest competitor, as they were three weeks nearer the London market than Australia. The discussion was very spirited. (Secretary, L. Yelland.)

MYPONGA (Average annual rainfall, 28.94in.).
June 16th.—Present: 16 members and 12 visitors.

FARM BUILDINGS.—Mr. R. C. West read the following paper:—"In the construction of farm buildings the main object is to have good solid posts which will stand in the ground as long as possible from rot and white ants, and for this purpose the sand gum is the best procurable in this district. To save trouble it is advisable to straighten the outside edges of the posts with an adze before erecting. Rails let or housed into the post makes the best and strongest job. When putting in the posts the chief point is to have the building set out square; a simple method is to remember the figures 3, 4, and 5. If one measures 3ft. along one side and 4ft. along the other side, it must be 5ft. across the angle for the building to be square. The next item is the rafters and pitch of the roof. All rafters should be strong enough or strutted to stop sagging. On an ordinary lean-to roof the most common mistake is the pitch; too often the mistake is made of not giving the roof sufficient fall. Plenty of fall not only keeps the shed cooler, but it also tends to keep it more watertight by allowing the water to get away quickly. A fall equal to 2ft. 6in. in 10ft. is little enough; in a gable roof a 3ft. pitch in a 12ft. span is small enough. With the roof purlins a mistake often noticed is that the timber is placed flat instead of on edge. This weakens the roof, because timber, say 3in. x 2in. on edge

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C. F. ANDERSON, Poultry Expert.

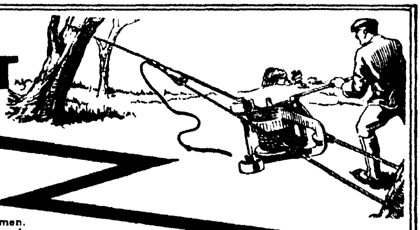
will hold twice as much weight as 3in. x 2in. flat. Gable roof purlins are often put on the flat to cut down the sizes of the ridge and the fascia boards, but this saving is not very much, unless the roof is a very big one. In putting on the iron always give at least a lap and a half joint at the edges, with one over and one under sheet, and it should be nailed every other flute. A shed put up properly will last for years without any repairing. The interior of a cowshed is an important part of the farm buildings, and should be so arranged that everything is as convenient as possible. Provide a passageway at the back of the bails for feeding purposes. In a cowshed where there is a double row of bails, have all the heads facing towards the centre, instead of towards the sides. If this is done it is a simple matter to have a small truck loaded with fodder, and go along to every bail and feed up. It is a good plan to have a wide passageway, so that at one end room will be available for bins to store bran, chaff, &c. A cowshed built on these lines will save a lot of work and running around. Each bail should be at least 5ft. wide to give ample room for getting in and out. The height should be at least 7ft. The mangers should be made of iron; these are easier to keep clean, and a tin drum cut in halves lengthways makes a good manger. The floor should be well drained and formed with a hard waterproof material such as asphalt, hard stone, brick, or concrete, and all joints and cracks filled with impervious material, so that no liquid can soak into them. The floor to each bail should have about a 2in. fall to allow for good drainage. In mixing concrete with ordinary river gravel, 6 or 7 to 1 is recommended. The dairy is the next most important building. Erect one with cavity walls either of brick or iron or some other material. The cavity causes a draught and keeps the building cool, while a roof with a good pitch is essential. A good cool roof for a dairy is one thatched, with iron over the top. The dairy should be as far as possible—though not to be inconvenient—from the cowsheds or yards, fowlhouses, and pigsties. A dairy should be at least 10ft. x 10ft. x 8ft. All openings should be covered with fly wire. Adequate ventilation is essential. A good pigsty has as much influence on the rearing of good pigs as the feeding. A pigsty should be at least 10ft. x 8ft., with a lean-to roof at least 5ft. high at the lowest point. A mistake often made with pigsties is to have the roof so low that one cannot get into them to clean them out properly. Further, such a roof makes the sty very hot in summer. The sty should be free from drafts. Ordinary wooden slabs make a good warm floor in a sty. In the farrowing pen a rail should be placed 6in. to 8in. from the floor to prevent the sow from injuring any of her young before they find their legs properly and are able to get out of her way. The floors should be at least 9in. above ground level. The stable should be fitted up in a manner similar to the cowshed, with a passageway behind the manger for feeding purposes. A stall for one horse should be at least 6ft. wide and 16ft. deep. A deep stable is most convenient because it provides room to hang the harness at the back of the horse. The floors should be similar to that of a cowshed and well drained. Attached to the stable should be the chaffhouse. One building lacking in this district on a number of farms is an implement shed. Most implements are left in the open, but an implement shed is as much to the profit of a farm as any other part of the equipment. To have success with poultry, good,

Mount Compass Field Day, September 1st, 1932.

warm sleeping houses are necessary. The fowlhouse should be at least 5ft. high at the lowest point for a lean-to roof, 6ft. high at the front and no deeper than about 8ft. If the house is too deep the sun only gets to the inside at the back for a very little while in the early morning. Where fowls are kept in captivity the ground space should be at least 4 square ft. per bird. The fowlhouse should face north-east in order to get the maximum of sunshine. Along the front of the house enclose at least 2ft. from the ground with iron to guard against draughts. The perches should not be any higher than a foot from the ground, especially for heavy strains of fowls. (Secretary, C. Martin.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Balhannah.....	12/8/32	17	Paper—" The Jersey Herd," H. Boehm	C. Grasby
Cherry Gardens	17/8/32	10	Address—C. F. Anderson	A. Stone
Blackwood	8/8/32	12	Address—R. Fowler	H. Goldsack
Blackwood	11/7/32	9	Annual Meeting	H. Goldsack
Macclesfield ...	18/8/32	13	Discussion	H. Ross
Kangarilla	18/8/32	250	Annual Social	T. Golder
Mount Pleasant	19/8/32	9	Lantern Lecture	D. Smith
Mount Barker .	—/7/32	—	Annual Meeting	P. Wise
Narrung	13/8/32	23	Annual Meeting	W. Lawrie, Pt. McLeay
Shoal Bay	16/8/32	10	Discussion	E. Bell, Wisanger
Hindmarsh Isld.	16/8/32	7	Annual Meeting	H. Newell
McLaren Flat .	11/8/32	25	Address—E. H. Fromen .	P. Wait
Mount Compass	4/8/32	46	Addresses—A. L. Warren and Dr. Douglas	C. Verco
Frayville	16/8/32	10	Address—R. Hill........	V. Eichler
Langhorne's Crk.	16/8/32	15	Addresses—H. Potts and M. Whittlesea	P. Nurse
Blackheath	18/8/32	8	Paper from *Journal*	E. Paech
Currency Creek.	18/7/32	11	Annual Meeting	D. Gordon
Narrung	30/7/32	12 and 8 visitors	Discussion	W. Lawrie, Point McLeay
Myponga	21/7/32	15 and 16 visitors	Address—R. Hill........	C. Martin



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CROWN LANDS.

LANDS OPEN TO APPLICATION.

Applications will be received until 3 p.m. on Tuesday, October 18th, 1932, for lands in the Hundreds of BARNA, BLACKER, BOOTHBY, BROOKER, BUCKLEBOO, BURGOYNE, CAMPOONA, CARALUE, CARAWA, CARINA, COLTON, COOTRA, CUNGENA, FINLAYSON, GOODE, HAGUE, HASLAM, KIANA, KOONGAWA, LAKE WANGARY, MAMBLIN, MANGALO, McLACHLAN, MILTALIE, MINBRIE, MINNIPA, MITCHELL, MOODY, MOORKITABIE, MORTLOCK, MOSELEY, PYGERY, ROUNSEVELL, SHANNON, SMEATON, SOLOMON, STURDEE, ULYERRA, VERRAN, WANNAMANA, WRENFORDSLEY, YADNARIE, and in the Counties DUFFERIN, KINTORE, and ROBINSON.

Full particulars are published in the *Government Gazette* of September 8th, 1932, and plans and detail may be obtained on application to the Director of Lands, Box 293A, G.P.O., Adelaide.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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S. R. WHITFORD.
Minister of Agriculture

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences, &c.

Non-Irrigated Fruit Districts, at Tanunda—Lone Pine Branch, November 1st. (Secretary, Mr. T. Fromm, Tanunda.)

The opening session will take place at 10.30 a.m. Papers, questions, &c., should be forwarded to the General Secretary, Agricultural Bureau, about a fortnight before the date mentioned above.

Ensilage and Grass Hay Competition.

The South Australian Advisory Dairy Board, in conjunction with the Department of Agriculture, is again promoting competitions for grass hay and ensilage amongst the dairyfarmers in this State.

Entries will be invited from dairymen in two (2) districts, viz., the Hills and South-Eastern districts, and will be restricted to those who are milking not less than seven cows.

Trophies and certificates will be awarded in each of the four competitions, and successful competitors will receive prizes as under:—

First	£3 3s. and certificate.
Second	£2 2s. " "
Third	£1 1s. " "

Entries will close on January 4th, 1933. Full details and entry forms can be obtained from the secretary, L. S. Smith, c/o Office of Minister of Agriculture, Education Building, Flinders Street, Adelaide.

Lower North Pruning Competitions.

The Secretary of the Lower North Pruning Competitions (Mr. J. S. Hammat) has pointed out that the name of Mr. J. B. Helbig was omitted from the list of competitors in the Langdon Parsons Cup as reported in the September issue. Mr. Helbig has scored a total of 1,089½ points, made up as follows:—Year 1931—trees 364, vines 183 (547); year 1932—trees 360, vines 182½ (542½). In the grand total for the two years his position is therefore eighth on the list.

Codlin Moth Control.

Any departure from old established ideas in the control of codlin moth is generally received with suspicion. Mr. C. H. Beaumont (District Horticultual Instructor) states that bandages are recommended as an aid to the usual spray programme for the control of codlin moth. The bandages are treated chemically so that there is no necessity for examination during the season. The larvae which shelter under them are killed by the solution used in the preparation of the bandages. Corrugated bands properly prepared are now available, and a 2in. band seems just as efficient as a wider one. It is said that 1,000 grubs may be killed by one band. The United States Bureau of Entomology have had the matter in hand, and the system is also being tried in Victoria.

VETERINARY INQUIRIES.

[*Replies supplied by Veterinary Officers, Stock and Brands Department.*]

Secretary, Agricultural Bureau, Arthurton, reports mare stiff in legs. Reply—If the stiffness occurred after foaling it may be a form of laminitis. Give a drench of raw linseed oil 1½ pints, turpentine 2 tablespoonsful, and that she be turned out into a good grazing paddock. No green crop or grain should be allowed.

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and
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the one oil that always
stands up

Greenock reports a Jersey heifer which had a swollen udder before and after calving, and is now desirous of drying her off prior to calving next October. Reply—Give the heifer 1 dessertspoonful of alum in 1 pint of cold water twice a day for three days, and gradually dry off by milking away a smaller quantity of milk at each milking. If possible, it is preferable to have her dry at least a month before her next calf. Cut down her green feed and grain. The condition is not serious providing there is no change in the character of the milk, such as presence of clots, stringiness, accompanied by heat and pain of the udder, which latter condition would indicate true inflammation of udder due to germs.

Secretary, Narridy Agricultural Bureau, asks treatment for itch on legs of horses. Reply—The application of the following preparation is recommended:—Lysol 1 tablespoonful, sulphur 2 tablespoonsful, raw linseed oil 1 pint.

Murraytown reports horses lame, but show no signs of bruises or swelling. Inquirer also asks treatment for blood worms. Reply—From the information supplied it is difficult to determine the seat of lameness. In the event of your still failing to locate the cause, turn horses out for six weeks, but before doing so examine carefully the hoof of each lame foot to see if any injury (puncture or bruise) is present. Treatment for blood worms is as follows:—(1) Starve horse for 18 hours. (2) At the end of that time give following drench for draught horse:—Raw linseed oil 1½ pints, oil of turpentine 4 tablespoons. Shake thoroughly and drench carefully. (3) Subsequently give 1 tablespoon of Fowler's solution of arsenic in a small damped feed night and morning for 14 days. (Buy a 1lb. bottle). (4) Feed on good quality chaff, bran, and crushed oats.

Secretary, Kangarilla Agricultural Bureau, reports cow with blocked teat. Reply—It appears that there is a constriction of the lower end of the teat canal. The only satisfactory way of overcoming this trouble is to have the teat operated on by a qualified veterinary surgeon. The repeated use of a teat dilator would perhaps help to overcome the trouble to some extent, but such relief would more than likely be only temporary, and unless very great care were taken with using the teat dilator, an attack of mammitis might result. The surgical operation suggested is a relatively simple one and will give permanent relief without risk if properly performed.

Taplan asks treatment for a dog with stomach worms. Reply—For three days feed the dog on bread and milk, or porridge and milk, and a little lean meat. Procure from a chemist half a dozen "Nema" capsules size 187 for adult dogs. A dog weighing 8-10lbs. give one capsule, a dog weighing 10-20lbs. give two capsules, a dog weighing 20-30lbs. give three capsules. For 12 hours before administering the capsules do not give any food, and after administering give no food for two hours. A small dose of Epsom salts (1 teaspoonful dissolved in water) two hours after capsules have been given will assist. To administer the capsules—open the dog's mouth by squeezing the cheeks and drop them in according to the number required, and follow with a little water to make the animal swallow. If the dog does not swallow straight away, do not hold the jaws together, but allow the animal to drop the capsule and try again.

Secretary, Bunora Agricultural Bureau, reports—(1) *Aged mare who periodically gets very lame.* (2) *Is it advisable for a stallion to serve mares every 10 days until they go "off season"?* Replies—(1) Blister the swelling with a biniodide of mercury (1 in 8) blister, which you will have to obtain from the nearest chemist. To do this, clip the area, wash thoroughly, an ddry. Then rub in blister for 10-15 minutes. After application tie mare up short, so that she cannot get nose down to part. Wash swelling next day. Turn out for four to six weeks. (2) The mare's period of oestrum is a week, and there is a three-weekly interval between each heat. It is advised—more especially for uncertain breeders which nevertheless come regularly on heat—that service be given more than once during one heat, and service during later part of heat is more likely to be successful than if performed at its commencement. It is not advisable that mares which have worked hard all day should be taken in the evening two to three miles to stallions, and again, mares should not be served before going to work. They should be rested both before and after service.

ANNUAL REPORT ON PASTURE IMPROVEMENT, KYBYBOLITE EXPERIMENTAL FARM, 1931-32.

[By L. J. Cook, R.D.A., Manager.]

A very fair pasture season was experienced during the year 1931-32. Of 657 acres of fields and plots that have been used solely for pasture production during recent seasons, 367 acres (56 per cent.) of them recorded increased carrying capacity over the previous season 1930-31, so that the number of livestock carried on the farm has not been much affected. Throughout the agricultural year—April 1st, 1931, to March 31st, 1932—an average of 1,464 sheep and 122 cattle have been kept on the farm, as against 1,322 sheep and 122 cattle during the previous 12 months, showing an increase of 142 sheep. However, 35 more acres of temporary pasture were available this season, the area cultivated for crops being 114 acres, and 138 acres left for temporary pasture, as compared with 149 and 103 acres respectively during 1930-31. Hence, 795 acres of fields of pasture, with the stubble feed of 114 acres, have carried 1,464 sheep and approximately 70 head growing cattle wholly throughout the season, as well as provide full pasturage for 40 milking cows during the pasture growing period, and portion of their feed during the balance of the season. Also 24 horses have had part-time grazing; 200 acres of the general pasture fields were not top-dressed this season, a saving of 10 tons superphosphate being made. These fields, however, had received good applications in the past, and the feed was not greatly affected this season through not being top-dressed.

THE SEASON.

The season commenced well; good germinating rains were received during March, and these were followed by a splendid fall of 1½ins. in mid-April, thus ensuring good early feed. April recorded approximately 2ins. of rain, 70 points above the average, which was most valuable to pastures. May produced just the average for that month, and being very well distributed, combined with mild temperatures, pastures developed really well. A heavier recording than usual was received during June, but again the distribution was good, and little or no check was made in growth until late in the month. July falls were a little less than usual, and pastures generally survived the cold months well, and the usual check in growth at this time of the year was not severe. August rains were sufficient, although below the average, whilst September started well, but a dry period commenced in mid-September, which persisted until February of this year. This period of 140 days is one of the longest without a useful rain on our records, and for the time of the year such a period has never been experienced since weather records have been taken here. Less than 1in. of rain was recorded for the four months, October to February. Good falls, registering nearly 2ins., occurred during the first half of February, and these were followed by useful rains in March. For the full 12 months 19½ins. were registered—more than 2ins. less than the average for the past 26 seasons.

The season promised well for clover growths; Subterranean and the naturalised clovers germinated well, and maintained good growth throughout winter and early spring, but abnormal spring conditions spoilt their finish, and although there was sufficient summer feed, the clovers did not mature well. Only a little meadow hay was obtainable, and there was a considerable shortage of clover seed for stock to use as autumn feed. The early autumn rains, however, retrieved the position, and prevented what might have been a serious shortage of paddock feed during March, April, and May of this year, and enabled the carrying capacity of fields to be maintained. The native-rooted grasses, *Danthonia* species, had another good season, and benefited greatly by the early autumn falls. The naturalised annual grasses, such as barley, silver, and Brome, were prominent during the season, especially during winter. Their seeds during early summer were troublesome to stock, but not to such an extent as usual.

Of the sown grasses, *Phalaris tuberosa* gave the most feed, especially during winter. Wimmera Rye gave good returns, and Perennial Rye very fair results. Both the latter suffered more during the cold months than others, but Perennial Rye benefited greatly by early autumn rains, responding as well as the native Wallaby grass.

Once again phosphate-dressed pastures showed to good advantage over non-fertilised lands.

The following table shows the monthly rainfall of recent years, compared with the average for the past 26 seasons:—

	1926. In.	1927. In.	1928. In.	1929. In.	1930. In.	1931. In.	1906-31. In.
April	2·10	0·20	1·50	3·12	1·15	1·98	1·28
May	3·17	2·92	2·24	2·16	1·39	2·54	2·53
June	1·24	1·63	2·53	3·32	0·34	3·40	2·77
July	2·71	2·14	2·71	3·08	4·34	2·52	2·92
August	3·31	4·02	0·90	1·84	3·65	2·32	2·65
September	1·79	0·91	3·12	1·75	2·95	1·85	2·65
October	2·27	0·52	4·47	1·50	2·55	0·47	1·88
November	0·68	2·06	0·99	0·97	0·93	0·38	1·41
December	0·83	1·31	0·17	1·66	2·94	0·06	1·16
	1927.	1928.	1929.	1930.	1931.	1932.	
January	0·51	1·59	1·35	0·02	1·59	0·02	0·55
February	1·20	1·74	0·22	1·57	0·10	1·92	0·98
March	0·96	0·55	0·65	0·06	0·98	2·11	0·93
Total	20·77	19·59	20·85	21·05	22·91	19·57	21·71

IMPROVEMENT OF NATURAL PASTURES WITHOUT CULTIVATION.

The work of top-dressing natural pastures with phosphatic fertilisers and lime was commenced in 1919, additional plots have been added from time to time, and at present there are 17 plots being used for this work, 13 of which are 3½ acres in area and four are 5 acres each. Since 1921 careful records of the grazing secured from the plots have been kept. For the past three seasons the plots have been continuously grazed in rotation by five flocks constituted according to the estimated carrying capacity, and a separate flock has been used for each type of fertilised pasture. That is, A and AA flocks, 20 sheep, have been used on unmanured land, 24 acres; B flock of 35 sheep has been used on 14 acres of land improved with superphosphate; C flock of 48 sheep has been used on 17 acres of land improved with lime and superphosphate; while D flock of 20 sheep has been used on 10½ acres of land improved with rock phosphates. Another small spare flock has been used on all fertilised plots, as required to utilise excess feed. Similar type and aged sheep have been used in each flock, constituted of 25 per cent. Waite Institute Merino wethers, and 75 per cent. Kybybolite Comeback ewes. Through the assistance of the Waite Research Institute we have been able to weigh these sheep monthly, and so keep a definite record of their development on this type of pasture.

The pastures have consisted principally of Wallaby Grass, Barley and Silver grasses, annual naturalised clovers, and of recent years one of the *Erodiums* has appeared on them in fair quantity.

The following table shows the fertiliser applied, with date, and rate of applications; whilst Table 3 shows the grazing results secured:—

TABLE 2.—*Fertilising of Natural Grazing Test, Kybybolite*, 1919-32.

Plot.	Total Fertiliser per Acre.	Date and Rate of Application.
1	1 ton Aluminium Phosphate Rock (412lbs. phosphoric acid)	1919, one application
2	11cwts. Aluminium Phosphate (227lbs. Phos. Acid)	1919, one application
	6cwts. Aluminium Phosphate (124lbs. Phos. Acid)	1920-25, 1cwt. per annum
	306lbs. 45% Superphosphate (63lbs. Phos. Acid)	1926-31, 51lbs. per annum
3	1 ton Lime (Calcium Carbonate)	1919, one application
	1 ton Lime (Calcium Carbonate)	1929, one application
	13cwts. 36% Superphosphate (240lbs. Phos. Acid)	1919-31, 1cwt. per annum
4	11cwts. Calcium Phosphate Rock (232lbs. Phos. Acid)	1919, one application
	6cwts. Calcium Phosphate Rock (127lbs. Phos. Acid)	1920-25, 1cwt. per annum
	3cwts. 82% Calcium Phosphate Rock (126lbs. Phos. Acid)	1926-31, ½cwt. per annum
5	1 ton Calcium Phosphate Rock (422lbs. Phos. Acid)	1919, one application
	10cwts. Calcium Phosphate Rock (420lbs. Phos. Acid)	1929, one application

TABLE 2.—*Fertilising of Natural Grazing Test, Kybybolite,* 1919-32.—continued.

6	No Manure (Check Plot).	
7	720lbs. 45% Superphosphate (148lbs. Phos. Acid)	1924-31, 90lbs. per annum
8	1,080lbs. 45% Superphosphate (222lbs. Phos. Acid)	1926-31, 180lbs. per annum
9	1 ton Gypsum (Calcium Sulphate)....................	1926, one application
	672lbs. 45% Superphosphate (138lbs. Phos. Acid)	1926-31, 1cwt. per annum
10	1 ton Lime (Calcium Carbonate)	1924, one application
	896lbs. 45% Superphosphate (185lbs. Phos. Acid)	1924-31, 1cwt. per annum
11	6cwts. Ephos Phosphate (188lbs. Phos. Acid)	1924, one application
12	No Manure (Check Plot).	
13	1 ton crushed Limestone (Calcium Carbonate)	1926, one application
	672lbs. 45% Superphosphate (138lbs. Phos. Acid)	1926-31, 1cwt. per annum
1A	No Manure (Check Plot).	
2A	768lbs. 45% Superphosphate (158lbs. Phos. Acid)	1929-31, three applications
3A	No Manure (Check Plot).	
4A	No Manure (Check Plot).	

TABLE 3.—*Returns of Natural Grazing Test, Kybybolite,* 1921-32.

Grazing in Sheep per Acre.

Year.	Plot 1.	Plot 2.	Plot 3.	Plot 4.	Plot 5.	Plot 6.	Plot 7.	Plot 8.	Plot 9.	Plot 10	Plot 11.	Plot 12.	Plot 13.	Plot 2A.	Plots 3A & 4A.
1921-2	1·52	1·64	1·84	1·48	1·33	1·11	—	—	—	—	—	—	—	—	—
1922-3	1·47	1·41	2·06	1·20	1·27	0·83	—	—	—	—	—	—	—	—	—
1923-4	1·91	1·31	2·50	1·33	1·53	0·80	—	—	—	—	—	—	—	—	—
1924-5	2·72	2·73	4·25	3·00	3·05	1·36	—	—	—	—	—	—	—	—	—
1925-6	1·64	1·58	2·92	1·78	1·71	0·71	·13	—	—	1·54	1·27	0·81	—	—	—
1926-7	1·84	1·66	3·81	1·59	1·84	0·56	1·91	1·27	0·98	1·78	1·67	0·99	1·99	—	—
1927-8	1·95	1·98	2·58	1·74	·98	0·68	1·79	1·34	1·50	2·16	1·89	0·97	1·86	—	—
1928-9	1·61	2·63	3·24	2·24	2·30	0·66	2·42	2·06	2·08	3·60	2·17	0·58	2·54	—	—
1929-30	1·11	2·40	3·73	1·38	1·62	0·86	2·36	2·15	1·95	2·42	1·85	1·05	2·52	1·19	0·64
1930-1	1·84	2·83	3·65	1·94	2·11	0·82	3·02	3·80	3·33	3·47	2·34	1·28	3·39	1·83	0·76
1931-2	1·58	3·26	3·60	2·04	2·71	0·82	3·79	3·99	3·63	2·92	2·33	1·25	3·31	2·04	0·79
Means—															
1921-32 ...	1·74	2·13	3·11	1·79	1·95	0·84	—	—	—	—	—	—	—	—	—
1926-32 ...	1·65	2·46	3·43	1·82	2·09	0·73	2·55	2·43	2·24	2·72	2·04	1·02	2·60	—	—
Increase above no manure—															
11 years..	0·90	1·29	2·27	0·95	1·11	—	—	—	—	—	—	—	—	—	—
6 years ..	0·78	1·59	2·56	0·95	1·22	—	1·68	1·56	1·37	1·85	1·17	—	1·73	—	—
Increase above all phosphate dressed plots—															
11-year period			1·21	—	—	—	—	—	—	—	—	—	—	—	—
6-year period			1·24	—	—	—	—	—	0·05	0·53	—	—	0·41	—	—
Increase above superphosphate-dressed plots—															
6-year period			0·94	—	—	—	—	—	—	0·23	-	—	0·11	—	—

In commenting on the above results, it is to be noted that the plots easily carried the flocks assigned to them in good store condition. There was a good carry over of feed from the previous March, and the flocks had good grazing through the autumn, winter, and spring months. The quick response of native grass to this year's February rain greatly assisted the pastures of these fields to complete the season satisfactorily. The Comeback ewes dropped lambs in August, and carried them on the plots until weaned in January. Five or six plots showed an appreciable increase on the previous year, eight plots carried approximately the same grazing, whilst only two showed much reduction. Plot 1, which has not been top-dressed since 1919, showed a depreciation of ¼ sheep per acre, and Plot 10 also had a leaner season. Plot No. 8, which has now received 180lbs. 45 per cent. superphosphate for six years in succession, produced the most feed, and carried approximately four sheep per acre. Plot No. 7, dressed with 90lbs. 45 per cent. superphosphate, was second with 3¾ sheep per acre, and showed the greatest improvement (¾ sheep) for the season. Plots Nos. 3 and 9, dressed with lime and superphosphate, and gypsum and superphosphate respectively, also carried over 3½ sheep per acre.

In comparing the six plots that have now provided results for 11 consecutive seasons, the four dressed with phosphatic fertiliser only have increased the carrying capacity approximately 1.06 sheep per acre, or 126 per cent. above that of the check plot; whilst the lime and phosphate-dressed plot has increased 2.27 sheep per acre, or 270 per cent. above the No Manure plot, and 1.21 sheep per acre, or 64 per cent., above the phosphate-only dressed plots. On Plot No. 1, which has not been dressed since 1919, the growths are thinning, moss is appearing rather plentifully, clovers are disappearing, and the land is reverting back to the unmanured type.

The addition of a small quantity of water soluble phosphate to Plot No. 2 is continuing to give an increased carrying capacity—and although of recent years this plot has only received half the quantity of phosphatic acid that has been given to Plot No. 4, its growth of pasture has been better. Since the change in application, Plot 2 has averaged 2.46 sheep per acre, as against 1.82 by Plot 4—over ½ sheep per acre better.

Plot No. 5 carried very good grass, and is continuing to show an advantage in applying large quantities of acid soluble phosphate at comparatively long intervals, in preference to applying this form of fertiliser in small quantities annually, as is done in the case of Plot No. 4. This year it yielded 0.67 sheep per acre better than Plot No. 4. For the whole 11 years it has been 9 per cent. better, and for the past six years it has been 15 per cent. superior to No. 4.

In the following table the averages of all plots for the past six seasons have been grouped together according to the various forms of fertiliser, and shows an interesting comparison of returns and value.

TABLE 4.—*Comparative Summary of Six Years Grazing on Top-dressed Natural Pasture.*

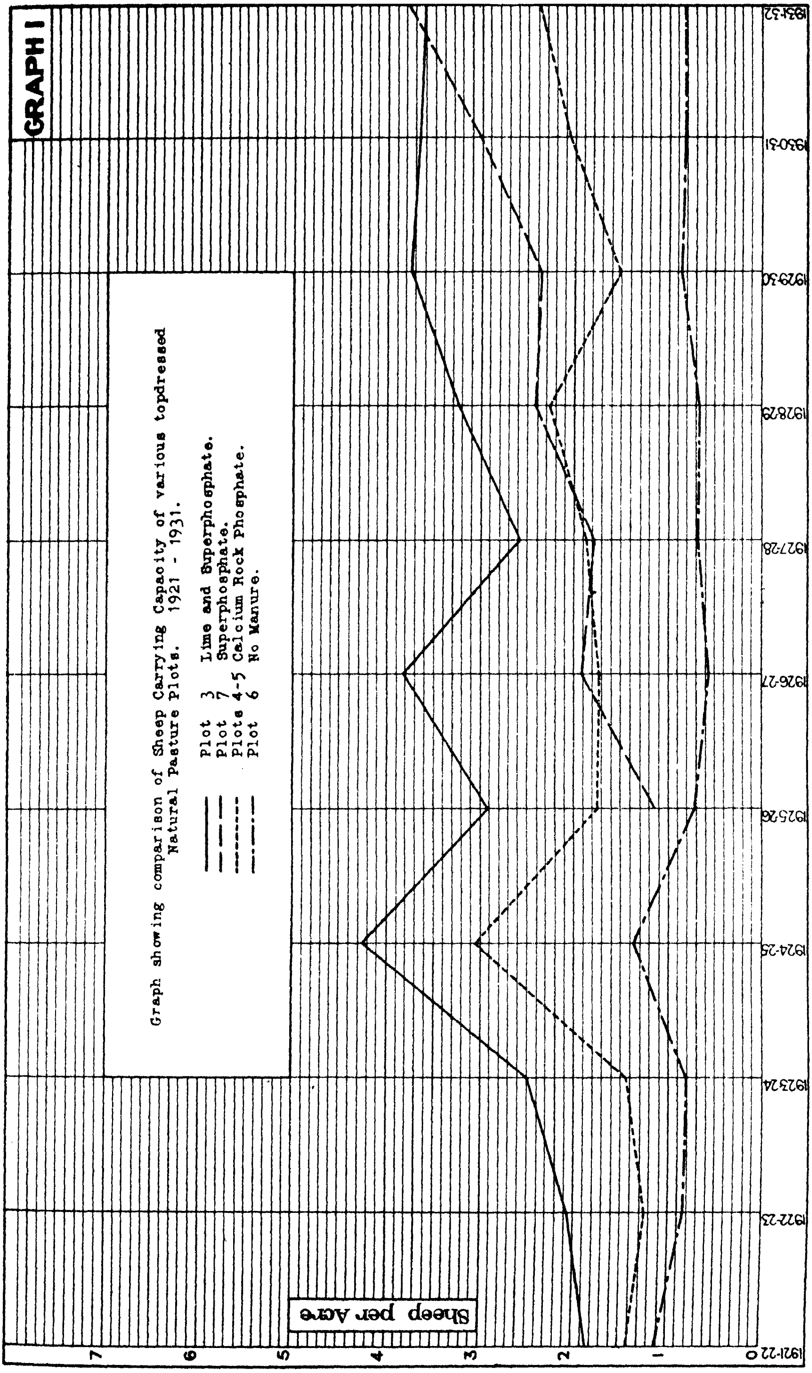
Fertilisers Applied.	Area.	Sheep per Acre.	Increase Over No Manure.	Increase Over Superphosphate.	Increase Over Rock Phosphate.	Annual Cost of Fertiliser per Acre.	Annual Cost of Fertiliser per Sheep.	Profit per Acre per Annum. Sheep at 10s
	Acres.		%	%	%	s. d.	s. d.	s. d.
Lime and Superphosphate (W.S. Phos.)	8½	3·01	234	21	63	11 0	5 3	10 1
Crushed Limestone and Superphosphate (W.S.P.)	5	2·60	189	5	41	8 3	4 10	8 9
Superphosphate (W.S.P.) .	10½	2·48	176		34	5 8	3 7	10 2
Gypsum and Superphosphate (W.S.P.)	3½	2·24	149		21	10 9	8 0	2 8
Ephos Phosphate (Cit. and Acid Sol. Phos.)	5	2·04	127		10	6 0	5 3	5 5
Crushed Rock Phosphate (Acid Sol. Phos.)	10½	1·85	106		—	4 2	4 5	5 4
No Manure (Check Plots)	8½	0·90	—		—	—	—	—

These results show that the greatest return of feed has been secured from the use of lime and superphosphate, lime applied at the rate of 1 ton per acre every 10 years, and superphosphate applied at the rate of 1cwt. annually. This fertilising costs approximately 11s. per acre per annum. Valuing sheep at 10s. each, this fertilising shows an annual profit of 10s. 1d. per acre.

The crushed limestone dust and superphosphate application is second in quantity of production, and this fertilisation has been at similar rates, namely, 1 ton per acre of limestone every 10 years and 1cwt. superphosphate annually. The dust costs approximately 22s. 6d. per ton on the land; that is 2s. 3d. per year, plus 6s. for superphosphate, 8s. 3d. for an extra return of 17s., or 8s. 9d. profit. The applications given to the three plots dressed with superphosphate only have averaged at rate of 105lbs. per acre per annum, and have returned a yield of 2.48 sheep per acre—third position on the table. The cost of this fertilising is 5s. 8d. per acre, and the extra return gained of 1.58 sheep means a cost of 3s. 7d. per sheep, and a gain of 10s. 2d. per acre profit when sheep are valued at 10s. each per annum. This shows superphosphate to be the cheapest fertiliser per sheep, and to be equal with lime and superphosphate in profitableness.

Rock phosphate with an average annual application cost of 4s. 2d. is the cheapest per acre, but is a little dearer per sheep, and the profit only shows at 5s. 4d. per acre per annum.

In further comparing these fertilisers the following Graph No. 1 shows the yearly carrying capacity secured from the use of Lime and Super No. 3, Super. only Plot No. 7, Calcium Rock Phosphate Plots Nos. 4 and 5, compared with check plot of No Manure Plot No. 6. It is to be noted that the super. plot was only commenced in 1924, and the increase in production has been marked during the last two seasons, this year exceeding the production of lime and super. for the first time.


GRAPH I
Graph showing comparison of Sheep Carrying Capacity of various topdressed Natural Pasture Plots. 1921 - 1931.
Plot 3 Lime and Superphosphate.
Plot 7 Superphosphate.
Plots 4-5 Calcium Rock Phosphate.
Plot 6 No Manure.
Sheep per Acre
0
1
2
3
4
5
6
7
1921-22
1922-23
1923-24
1924-25
1925-26
1926-27
1927-28
1928-29
1929-30
1930-31
1931-32

With reference to the type and variety of plants growing on this series of plots, again we were unable to make any true botanical analyses of the growths of the various fertilisations, but from general observations, the only plant to make noticeable increase in quantity is a species of *Erodium*, which has become more in evidence on the limed plots. Wallaby Grass and annual grasses remain more or less constant, and except on the more recent reclaimed plots, the naturalised clovers are remaining at about 30 per cent. of the herbage. Rooted Cat's Ear did not make its usual heavy summer growth. Thistles that had infested the lime plots of recent years were not so plentiful on these this season, but increased on other plots, that have been carrying a lot of stock.

In considering the behavior of sheep flocks used for grazing these natural pasture plots, the following table and graphs are of interest in showing the results gained from the Comeback ewes in the flocks.

TABLE 5.—*Weights of Sheep and Wool, Natural Pasture Plots*, 1930-32.

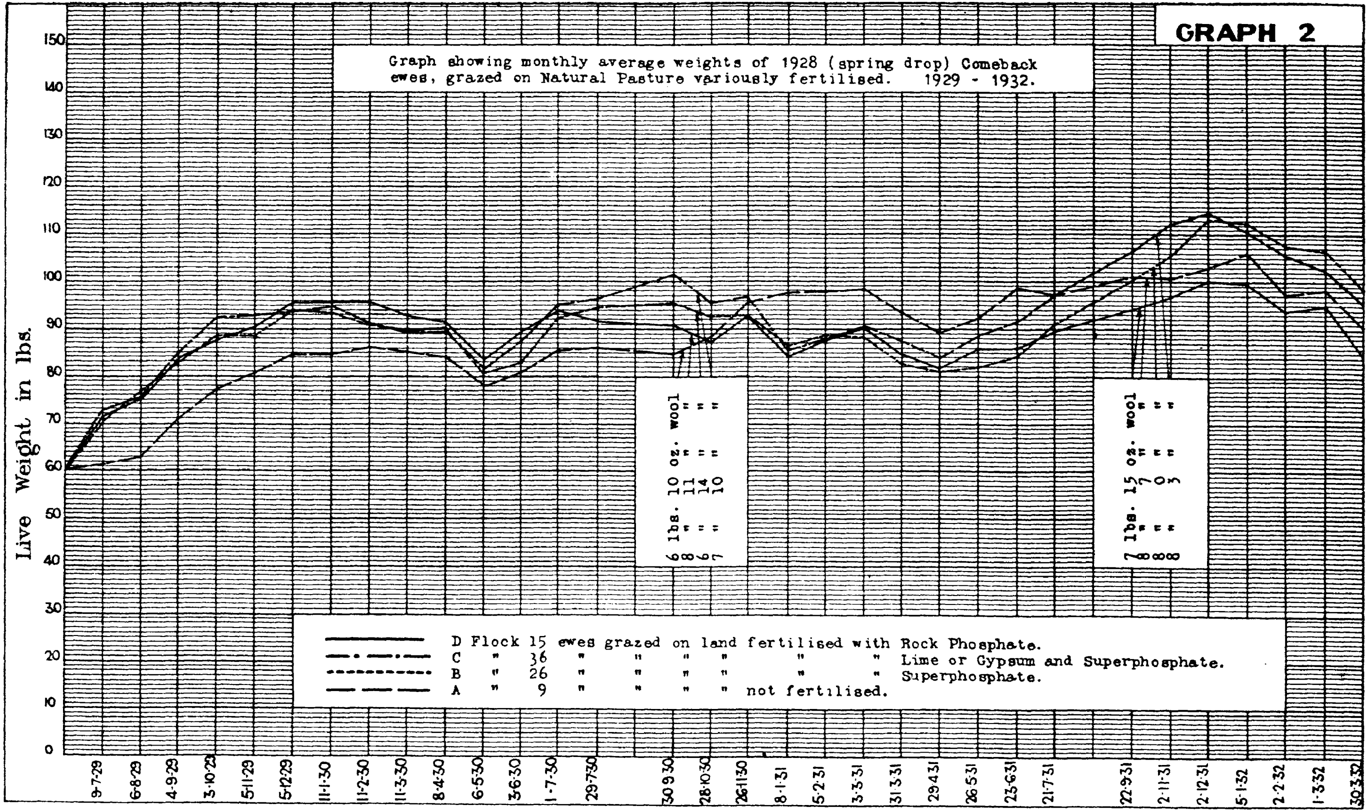
Flock.	No. of Ewes.	Kind of Fertiliser on Plots Grazed.	Average Weight of Ewes.			Average Weight of Wool per Sheep.			
			8/4/30.	31/3/31.	30/3/32.	17/10/30.		21/10/31.	
			Lbs.	Lbs.	Lbs.	Lbs.	Ozs.	Lbs.	Ozs.
A	9	No Manure	83·8	93·2	90·7	6	10	8	7
B	26	Superphosphate	90·0	82·5	98·5	6	14	8	0
C	36	Lime, Gypsum, and Super.	89·3	87·3	95·3	7	10	8	3
D	15	Rock Phosphate	91·2	84·7	84·3	8	11	7	15

Flock.	No. of Ewes.	Kind of Fertiliser on Plots Grazed.	Lambs Marked.		Average Weight of Lambs.		Sheep Carried per Acre.
			9/10/30.	1/10/31.	8/1/31.	5/1/32.	1930-32.
			%	%	Lbs.	Lbs.	
A	9	No Manure	22	66	40·0	60·8	1·08
B	26	Superphosphate	81	50	44·5	57·3	3·07
C	36	Lime, Gypsum, and Super.	89	66	39·2	52·6	3·39
D	15	Rock Phosphate	80	73	44·2	48·5	2·04

All of the ewes in the above flocks are of similar age and breeding (1928 spring drop), and were selected as even in type and development in May, 1929. Since then they have been kept wholly on the one class of pasture. Except from March 25th, 1930, until May 5th, 1930, and from March 19th, 1931, until April 29th, 1931, when the 86 ewes were mated together as one flock with Merino rams, they have been pastured on the respective plots shown in above table. The table shows the average weight of ewes in each flock taken at the beginning and end of each grazing year, the average weight of wool shorn in October, 1930 and 1931, and constitutes 12 months' growth in each case (ewes were blade-shorn each season). Results of lambing are shown as percentages of lambs marked, and the average weight of lambs taken at weaning. Also the actual grazing results taken from the various groups of plots is shown in the final column.

Graph 2 shows clearly how the weight and development of ewes vary throughout the season; each year there has been a steady and regular increase during the pasture-growing periods May to December, and a loss of weight during autumn, when the feed was mostly dry.

It is noticeable that during the first season, as hoggets, the ewes developed comparatively well and evenly; the second season, 1930-31, their first breeding year, the flocks generally did not develop so well, and three flocks, B, C, and D, suffered rather badly in the autumn of 1931. However, this last season, 1931-32, with the exception of Flock D, much improved average weights have been recorded, Flocks B and C reaching 113 and 114lbs. in December, and falling only to 98 and 95lbs. this autumn.



GRAPH 2

Graph showing monthly average weights of 1928 (spring drop) Comeback ewes, grazed on Natural Pasture variously fertilised. 1929 - 1932.

In considering individual flocks, A Flock, that has been developed on unmanured pasture, showed a much slower development than the others on fertilised land. The first season they did not reach nearly the weights of the others, although they gained and lost weight at similar times. During the second season they were also well behind until late in the season. As maiden ewes that year they produced very few lambs—only 22 per cent.—which accounted for the fact that in average weight they were superior to other flocks during autumn and winter months of 1931. They yielded 66 per cent. lambs this season, and since then their weights have receded, and Flocks B and C have improved beyond them. A glance at Graph 3 shows that the ewes in this flock that reared lambs this season have felt the effects greatly, and their weights are some of the poorest in the flocks, whereas the dry ewes in this flock have continued to maintain good weights, and at present are the heaviest of the flocks. Considering that the flock has only averaged 44 per cent. lambs for the two breeding seasons, it could have been expected that a greater yield of wool would have been produced. Instead, although the flock in the two seasons has produced 3ozs. per head more wool than Flock B, it has yielded 12ozs. and 25ozs. less per head than Flocks C and D respectively, and these latter have also produced 75 per cent. more lambs.

It must be noted that to supplement the amount of unfertilised feed, Plot No. 9 in unmanured clover land series has necessarily had to be used at times by this flock, which accounts for the carrying capacity of plots grazed showing at 1.08 sheep per annum, which is higher than unfertilised virgin land, and should, if anything, give the flock an advantage.

Of the three flocks grazing on fertilised plots, Flock C on lime and supered land, so far, has proved to be the most productive, combined with good health. Flock D has produced most wool, and practically equal in lambing percentage to C flock. The condition of the ewes, however, in D Flock, especially those that have reared lambs this last season, is poor, and as bad as those in A Flock. It appears to show that the strain of two comparatively good lambings has been severe on these. C Flock has produced equal proportion of lambs, and the ewes have stood the strain better, and are now in much better order for the next breeding season. Ewes in Flock B suffered heavily after the first lambing, and a lot were in comparatively low condition for the second mating. However, the flock had a light lambing, and the ewes have improved this last summer, and the flock is now in equal condition with C Flock for next season's breeding.

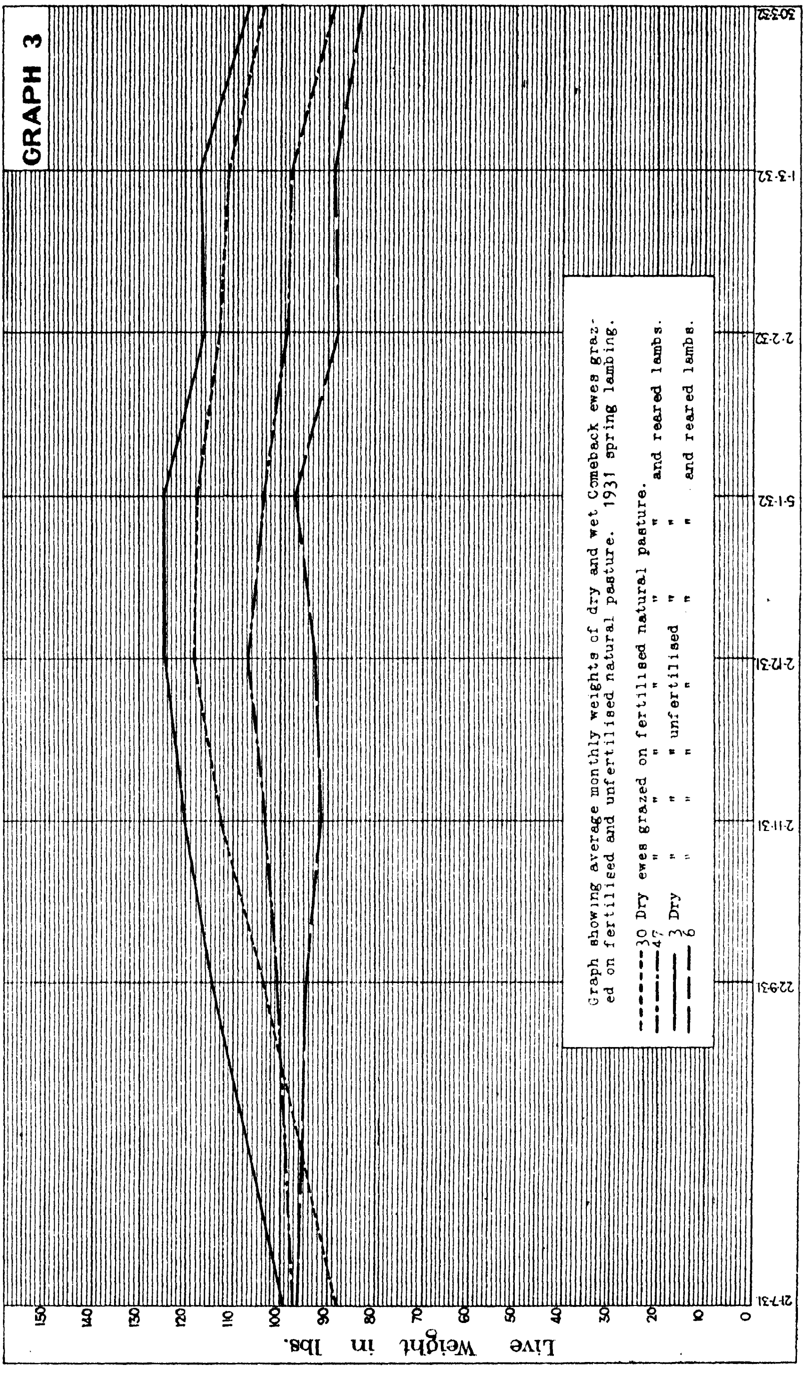
It is to be noted that since this experiment was commenced in 1929, only one loss of ewe has occurred; 1 young hogget died in Flock B during October, 1929; 2 lambs in B Flock, and 5 lambs in C Flock died between marking and weaning in 1930-31 season; whilst 1 lamb in A Flock and 2 lambs in B Flock died this last season, 1931-32. No other deaths have occurred amongst these flocks during the three seasons.

Considered on the whole, the land fertilised with lime as well as superphosphate shows to best advantage, with its high carrying capacity of 3.39 sheep per acre, combined with highest lambing percentage, above the average in weight of wool, and general good health of sheep.

The sheep have had no hand-feeding. They had a course of drenching for internal parasites during 1931, but have received no licks, and have therefore depended entirely on the pasture growths for their total food.

The general conclusions apparent on this class of pasture are that, in the virgin state it is not suitable for breeding sheep, but satisfactory for carrying store sheep, and producing good-quality wool. When improved with fertilisers the pastures become

GRAPH 3



Graph showing average monthly weights of dry and wet Comeback ewes grazed on fertilised and unfertilised natural pasture. 1931 spring lambing.

fair for breeding purposes, carry many more sheep, and although the quantity and quality of wool per head is not materially affected, the quantity per acre has been increased 18.67lbs. per annum, or 230 per cent., by manuring with lime and super., 16.70lbs., or 205 per cent., by manuring with superphosphate only, and 8.83lbs., or 109 per cent., by manuring with ground rock phosphate.

Sown Pastures: Subterranean Clover and Wimmera Rye Grass.

The 15 plots of this pasture mixture established during 1924 are being maintained, and fully grazed each season. This year they were again grazed in rotation, using 213 ewes (98 half-bred ewes, 65 Combeback ewes 1929 drop, and 50 Comeback ewes 1930 drop). They were proportionately divided into four flocks on the 65 acres of manured plots. There was a good carry-over of feed on the plots from the 1930-31 season, and grazing has been continuous on the plots for the whole season of 1931-32. There was a large growth of clover and annual grasses this season. Wimmera Rye grass was present, but in only small proportion.

Table 6 shows the fertiliser given to the various plots, with the rate and time of application, together with the grazing results for the past seven years.

Table 6.—*Fertiliser Test on Subterranean Clover and Wimmera Rye Grass, Kybybolite*, 1925-32.

		Sheep per Acre per Year.							
Plot.	Manuring per Acre.	1925-6.	1926-7.	1927-8.	1928-9.	1929-30.	1930-1.	1931-2.	**1925-32. Mean.**
1	1cwt. Tetraphosphate annually, 1923-29	2·76	3·53	2·15	2·89	3·25	2·71	3·55	**2·98**
2	5cwts. Tetraphosphate, 1923; 78lbs. 105% Triple Phosphate, 1931	2·76	3·15	2·10	2·66	2·89	2·22	2·99	**2·68**
3	10cwts. Lime, 1923; 1cwt. Tetraphosphate annually, 1923-27; 1 ton Gypsum, 1928; 1cwt. 45% Superphosphate annually, 1928-31	2·47	2·97	2·63	4·27	4·40	4·79	5·18	**3·82**
4	90lbs. 45% Superphosphate annually, 1923-31	3·12	3·72	3·05	3·90	4·52	4·30	4·86	**3·92**
5	5cwts. 36% Superphosphate, 1923; 180lbs. 45% Superphosphate annually, 1928-31	3·06	3·21	2·06	4·35	5·37	5·29	4·77	**4·02**
6	No Manure, 1923-26; 45lbs. 45% Superphosphate annually, 1927-31	1·81	1·88	2·70	2·73	2·55	3·53	2·58	**2·54**
7	1 ton Lime, 1924; 1cwt. 45% Superphosphate annually, 1924-31	3·04	3·70	3·28	3·96	4·52	5·24	5·47	**4·17**
8	6cwts. 61% Ephos Phosphate, 1924	3·32	3·95	3·92	3·75	3·77	5·09	4·14	**3·99**
9	No Manure (Check Plot) ...	2·13	1·95	1·94	1·20	1·16	1·27	0·88	**1·50**
10	4cwts. 82% Rock Phosphate, 1924 and 1929..........	3·02	3·79	3·01	2·49	2·75	2·76	3·37	**3·03**
11	4cwts. 82% Rock Phosphate and 1cwt. 45% Superphosphate, 1924	3·62	3·68	3·76	3·88	2·70	3·82	2·56	**3·43**
12	37lbs. 90% Potash annually, 1924-31	2·60	2·68	1·99	2·25	2·13	2·47	2·03	**2·31**
13	37lbs. 90% Potash annually, 1924-31; 4cwts. 82% Rock Phosphate, 1924; and 4cwts. 82% Rock Phosphate, 1929	3·27	3·69	3·40	3·62	3·34	3·04	3·90	**3·47**
14	6cwts. 33% Bone Manure and 1cwt. 45% Superphosphate, 1924	3·13	2·68	3·07	2·98	2·67	2·26	2·62	**2·77**
15	1cwt. 45% Superphosphate annually, 1924-31	3·51	4·14	3·71	4·05	4·32	2·91	4·53	**3·88**
	Means	2·92	3·26	2·88	3·25	3·32	3·42	3·54	**3·23**

In commenting on this table, it is to be noted that very high yields are continuing to be received. Plot No. 7, in carrying 5.47 sheep per acre, is the greatest received from any plot for the seven years of the experiment, and it is of particular note that this plot has been regularly improving each season, from 3 sheep per acre in 1925 to 5½ sheep per acre this year, giving an average carrying capacity over the seven seasons of 4.17 sheep. This plot has been fertilised with 1 ton lime per acre in 1924, and 1cwt. 45 per cent. super. each autumn since. Plot No. 3, fertilised with gypsum and super., was second this season with 5.18 sheep per acre, which is also the best return that this plot has given. The season with its quick finish undoubtedly gave these two plots an advantage, as the effect of lime and gypsum is to hasten early growth and quick maturity of plants. The three plots Nos. 4, 5, and 15, dressed with superphosphate, all yielded good returns this season of over 4½ sheep per acre. For the past four seasons Plot No. 5 has been dressed with 180lbs. 45 per cent. super. per acre per annum, and for the four years has carried an average of 4.95 sheep per acre. Plot No. 4, with 90lbs. super. per acre for the same period, has carried 4.40 sheep, and Plot No. 6, with 45lbs. super., has carried 2.85 sheep per acre. The check plot (no manure) has carried during these years 1.13 sheep, hence it is readily seen how responsive this pasture is to continued superphosphate dressings. The four plots are tabulated together as follows, showing yields of pasture, cost of fertiliser per acre and per sheep, and profit when sheep are valued at 10s. per annum.

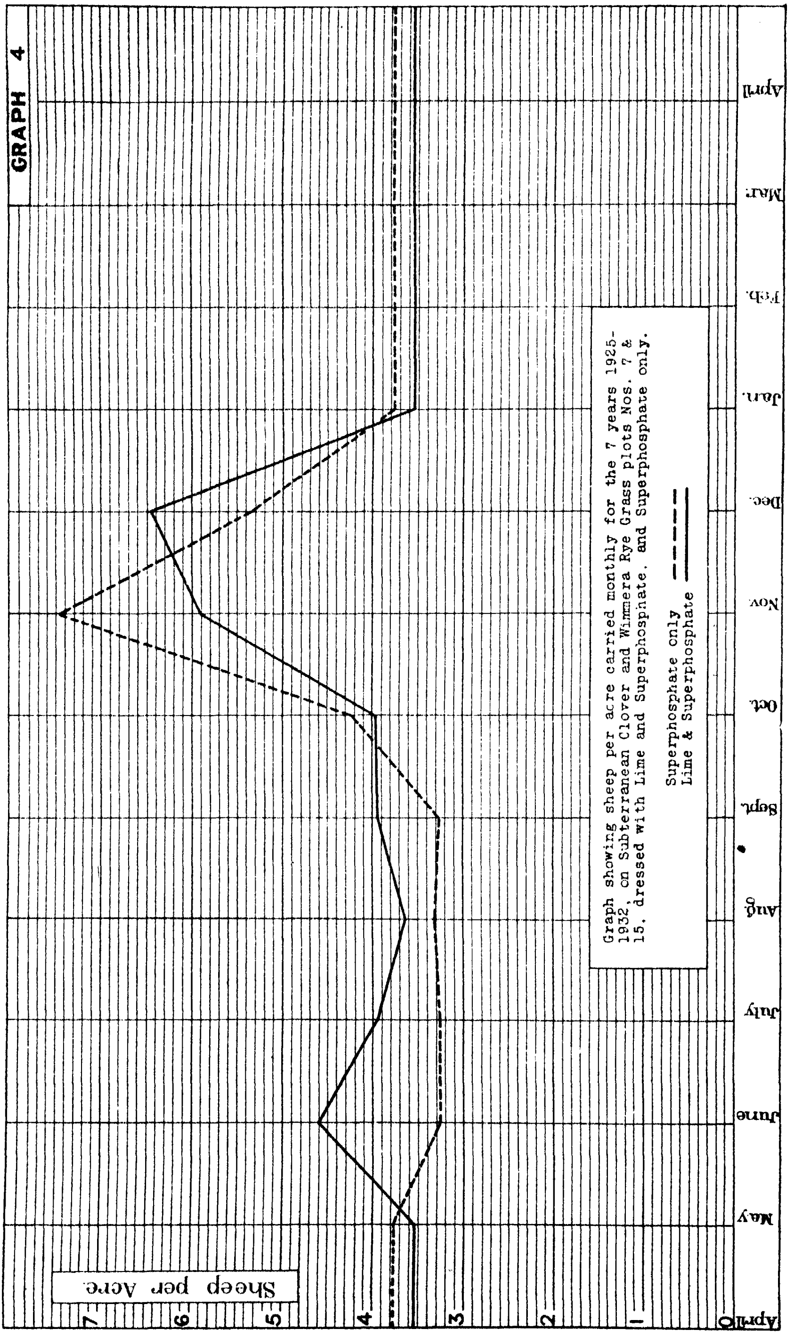
TABLE 7.—*Superphosphate Quantity Test on Subterranean Clover and Wimmera Rye Grass*, 1928-1931.

Plot.		Sheep Carried per Acre.	Increase over No Manure.	Cost of Fertiliser per Acre.	Cost of Fertiliser per Sheep.	Value of Increased Grazing at 10s. per Sheep.	Profit per Acre per Annum Due to Fertiliser.
				s. d.	*s. d.*	*s. d.*	*s. d.*
No. 5.	180lbs. super.	4·95	3·82	9 4	2 5	38 2	28 10
No. 4.	90lbs. super. ...	4·40	3·27	4 11	1 6	32 8	27 9
No. 6.	45lbs. super. ...	2·85	1·72	2 8	1 7	17 2	14 6
No. 9.	No Manure	1·13	—	—	—	—	—

These results are the average annual returns over a four-year period, and indicate the value to be obtained from the use of superphosphate on a sown pasture of Subterranean Clover and Rye grass, combined with systematic rotational grazing. For this grazing the fertilised plots have been fed off monthly in rotation with approximately 16 sheep per acre, whilst the unfertilised plot was grazed monthly with approximately three sheep per acre.

The attacks of the larvae of the cockchafer beetle during winter did not affect any of the plots this season, and consequently Plot No. 15, which is also fertilised with super., recovered well from the set-back it received in 1930-31.

Referring further to Table No. 6, the averages for the seven seasons show clearly that Lime and Superphosphate are the most productive of the fertilisers tried. The two combined have given the greatest yield, whilst superphosphate on its own has yielded almost as well in quantity of feed. Lime has an advantage, however, in producing quicker early feed, and more during the colder months of the year. Graph 4 shows the monthly grazings secured from Plots Nos. 7 and 15 during the seven seasons, and shows this advantage of lime in providing winter feed.



Graph showing sheep per acre carried monthly for the 7 years 1925-1932, on Subterranean Clover and Wimmera Rye Grass plots Nos. 7 & 15, dressed with Lime and Superphosphate, and Superphosphate only.

This graph shows the actual average monthly grazings taken from the two plots, and although they have been grazed to their full during the winter months, the flush growth of spring has not been completely used at that time of the year. It naturally has been necessary to allow this growth to mature to provide feed for late summer and autumn. The comparatively heavy grazings of October, November, and December are due to the allowance for lambs, which were dropped by the ewes on the plots during August, and weaned early in January. The graph shows that quite an appreciable increase of pasture has been received from the lime and super. plot during June, July, August, and September, whilst the autumn feed of January, February, March, and April has been greater on the super. only plot. This is apparently due to the greater proportion of clover in the super. only pasture, providing more clover seed for stock at this period.

Plot No. 8 dressed with 6cwts. Ephos phosphate in 1924 has also yielded a high return of pasture—approximately four sheep per acre average. This pasture has not given such good winter feed as lime and super. plot, but has maintained a high content of clover.

The average results of the principal plots for the past four years are compared below in order of productivity.

TABLE 8.

Kind and Rate of Fertiliser.	Annual Cost of Fertiliser.	Increase above No Manure. Sheep per Acre Carried.	Sheep. per Acre.	Percentage.	Value at 10s. per Sheep.	Profit per Acre per Annum Due to Fertiliser.
	s. d.	%	%		s. d.	s. d.
1. Annual dressing 180lbs. 45% super.	9 4	4·95	3·82	338	38 2	28 10
2. Single dressing 1 ton Lime and Annual dressing 1cwt. 45% Super.	11 0	4·80	3·67	325	36 8	25 8
3. Single dressing 1 ton Gypsum and Annual dressing 1cwt. 45% Super.	10 9	4·66	3·53	312	35 4	24 7
4. Annual dressing 90lbs. 45% Super.	4 11	4·40	3·27	289	32 8	27 9
5. Single dressing 6cwts. Ephos Phosphate	3 9	4·19	3·06	271	30 7	26 10
6. *Annual dressing 1cwt. 45% Super.	6 0	3·95	2·82	250	28 2	22 2
7. Dressing 4cwts. Rock Phosphate every five years and Annual dressing 37lbs. Potash	9 8	3·47	2·34	207	23 5	13 9
8. Single dressing 4cwts. Rock Phosphate and 1cwt. 45% Super.	2 9	3·24	2·11	187	21 1	18 4
9 Annual dressing 45lbs. 45% Super.	2 8	2·85	1·72	152	17 2	14 6
10. Dressing 4cwts. Rock Phosphate every five years	4 2	2·84	1·71	151	17 1	12 11
11. Annual dressing 37lbs. 90% Potash	5 6	2·22	1·09	96	10 11	5 5

*During 1930-31 this plot was badly affected by ravages of caterpillars.

From the above, it is apparent that, so far as quantity of production is concerned, the water soluble phosphates and lime are the most remunerative fertilisers to apply. They have yielded approximately 63 per cent. better than acid soluble phosphates. Potash fertiliser shows an increase of 96 per cent. over no manure, but when combined with acid soluble phosphate it gives only an increase of 22 per cent.

(To be continued.)

PROGRESS

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WHEAT VARIETIES IN SOUTH AUSTRALIA.

[By R. C. Scott, R.D.A., Supervisor of Experimental Work.]

(Paper read at the Forty-third Congress of the Agricultural Bureau, September, 1932.)

Since wheat was first planted in South Australia some hundred years ago, much has been done in the development of varieties specially suited to the soil and climatic conditions obtaining in the State.

The difficulty encountered by the early wheat farmers was that although numerous varieties were imported from overseas not one was found to be well suited to the stringencies of the climate. The chief faults of the imported wheats appear to have been their lateness in maturing, their lack of resistance to early summer drought, and their liability to attack by red rust. Consequently, whilst in favorable seasons satisfactory yields were harvested, on the average the returns were very disappointing.

It was therefore evident that special types would have to be evolved if the State were to make progress in wheat production. In this connection we owe a debt of gratitude to such men as Messrs. J. Ward, Port Pirie; H. J. Gluyas, Port Germein; R. Marshall, Wasleys; J. King, Georgetown; D. Leak, Second Valley, and a number of others who in the early days isolated and built up improved strains of wheat.

In fact, several of the varieties selected by these men are still being successfully grown to-day whilst practically all have been used as parents in the production of our best wheats.

HISTORY OF WHEAT VARIETIES.

In view of the importance of the wheat industry in South Australia and the part which the foundation wheats have played in its development a few notes regarding the history of varieties may be of interest.

The early records indicate that toward the middle of last century Red Straw, Club Head, Brodies, and Goldsmith were the varieties commonly grown. No mention is made of their origin, but they were probably imported from England.

In the sixties red rust was particularly severe and wheat crops were badly affected. However, farmers had no opportunity of securing more resistant types, and 25 years later Red Straw and Club Head were still being largely grown, whilst Purple Straw and Talavera had taken the places of Brodies and Goldsmith.

This unsatisfactory state of affairs continued for some years, and despite the importation of wheats from overseas very little headway was made.

The turning point appears to have been the selection of Ward's Prolific by Mr. J. Ward of Port Pirie in 1881, and since that time there has been steady improvement in the disease and drought resisting qualities of the varieties available for planting.

In the early reports of the Department of Agriculture published by Professor Custance in 1882 to 1887, mention is made of the fact that hot winds of early summer consistently affected the majority of wheat varieties and often completely ruined many of those imported from England. Professor Custance added that as the result of these tests which embraced 46 varieties and included the recognised South Australian wheats, together with importations from England, India, South Africa, and New Zealand, he was certain that an early ripening type was necessary for maximum yields under local conditions.

The most promising wheats in these experiments were Early Baart, Purple Straw, and Ward's Prolific. It is interesting to note that from these three wheats many of the best varieties grown in the Commonwealth have been derived.

During the next few years there was considerable improvement in the quality of the wheats available for planting. The more important types developed before the end of the century were Early Gluyas, Marshall's No. 3, King's Early, Carmichael's Eclipse, Steinwedel, Leak's Rust Proof, Baroota Wonder, and Early Para. There were, of course, many other varieties being seeded, over a hundred in all being listed in the State, but those mentioned were the most popular. Early Baart and Purple Straw lost favor, but Ward's Prolific retained its position, although it appears to have been somewhat unfixed in type, as a number of selections were made from it, including Early Gluyas, Marshall's No. 3, Carmichael's Eclipse, and Baroota Wonder.

From 1900 onwards the influence of the plant breeding stations situated in the different States began to be felt.

New crossbred wheats were built up and distributed throughout the Commonwealth. At Roseworthy Agricultural College organised selection and wheat breeding work was commenced, whilst Mr. R. Marshall, of Wasleys, who had long been experimenting with varieties, was successful in evolving new wheats of considerable value.

The position regarding suitable varieties was, therefore, very much improved, and farmers could secure types able to respond under the particular conditions in which they happened to be working.

The principal new wheats were Federation, Yandilla King, Late Gluyas, King's White, and German Wonder, whilst during the past 10 years or so Queen Fan, Caliph, Currawa, Ford, Daphne, Sultan, Felix, Gallipoli, Waratah, and Nabawa have come into prominence. These represent the wheat varieties which have been extensively seeded throughout the period of wheat production in South Australia, and we can now proceed to briefly outline their origin and principal characteristics.

Origin and Principal Characteristics of the More Important Wheats.

Early Baart.—A bearded early-ripening wheat imported into South Australia from Cape Colony about 1880. Because of its early maturing properties it tended to escape the attacks of red rust and also ripen its grain before the hot weather of summer was experienced.

Purple Straw.—Imported into New South Wales from California in 1851, and some 10 years later introduced into this State, where it became very popular because of its drought-resistance. It is one of the parents of Federation.

Ward's Prolific.—The result of a selection made by Mr. J. Ward, of Nelshaby, Port Pirie. In 1880 Dr. Schomburgk imported a number of wheat varieties from overseas and distributed them amongst farmers. Samples were forwarded to Mr. Ward for trial, and in the second year he noticed a single rust free plant in the plot of Du Toit's wheat. The remaining plants were badly infected.

The grain from the rust-free plant was harvested separately and formed the starting point of Ward's Prolific variety. It retained a certain degree of rust resistance, and also yielded well under low rainfall conditions, with the result that it soon became the most widely cultivated wheat in South Australia.

Early Gluyas.—This wheat owes its origin to the work of Mr. H. J. Gluyas, of Port Germein. In 1894 Mr. Gluyas selected eight or nine strains from Ward's Prolific, finally retaining two which exhibited marked drought and disease resistance. These he named Early Gluyas and Gluyas Dark Straw. The latter has now gone out of cultivation, but in the opinion of Farrer was identical with the wheat known as Wilkinson. Early Gluyas possesses characteristics which may be regarded as typical of a drought resistant wheat for South Australian conditions, namely, relatively sparse stooling habits, fine willowy straw, and a minimum amount of flag coupled with resistance to rust and early maturing qualities.

Marshall's No. 3.—Was raised by Mr. R. Marshall, of Wasleys, in 1890, when he selected a white chaffed wheat with purple straw from a crop of Ward's Prolific.

In subsequent cultivation both purple and white strawed plants were produced and by further selection Mr. Marshall succeeded in fixing both types. The former he named Marshall's No. 3, and the latter Silver King.

King's Early.—A selection from a crop of Early Baart made by Mr. Joseph King, of Georgetown. The distinguishing features were earliness in ripening and solidity of straw. This wheat yielded both red and white colored grain. Later on the colors were separated at Roseworthy Agricultural College to form two distinct varieties, namely, King's Red and King's White.

Carmichael's Eclipse.—A bold eared velvet chaffed wheat raised by Messrs. Carmichael Bros., of Telowie. Is probably a selection from Ward's Prolific, although the variety has been claimed to be a cross between Ward's Prolific and Velvet Pearl.

Steinwedel.—This is one of the earliest wheats in the State, originating about the same time as Ward's Prolific. It was selected from a crop of Farmer's Friend by Mr. A. Steinwedel, of Balaklava. It proved very vigorous and prolific, but had the disadvantage of tending to badly shatter its grain.

Leak's Rust Proof.—A selection made by Mr. D. Leak, of Second Valley, about 1887. In a badly rusted crop of White Tuscan a single plant was found which was quite clean of disease. It had fine tough straw, but the ears were short and thin. The resulting variety proved distinctly rust resistant, whilst by selection the yielding ability and characteristics of the ear have been much improved.

Early Para.—This variety originated from a beardless plant found in a crop of African Bearded Wheat. It was built up by Mr. A. B. Robin, of Nuriootpa. For a time it was very popular, but was eventually discarded because of its weak straw.

Federation.—Was bred by William Farrer, of New South Wales, in 1895, who five years later forwarded grain of the new crossbred to Mr. F. Coleman, at Saddleworth. The results obtained were much superior to those secured from other varieties, and in the space of a few years large areas were placed under cultivation. This was not only the case in South Australia, but also throughout the Commonwealth generally, and the work of Farrer with this one variety alone has meant much increased wealth to Australia. The parents of Federation are Yandilla and Purple Straw.

Yandilla King.—This is probably the most successful variety produced by Mr. R. Marshall, of Wasleys, and is the result of crossing Yandilla with Silver King.

Late Gluyas.—A selection from Early Gluyas made at Roseworthy Agricultural College which ripens its grain a few days later than its parent. It also possesses stronger, stouter straw and bolder ears. Whilst not quite as hardy as Early Gluyas, it has proved a good wheat in those districts where, because of local conditions, the tendency for the latter to lodge is a serious defect.

King's White.—The strain of white colored grain isolated from King's Early at Roseworthy College.

German Wonder.—An earlier ripening selection from Marshall's No. 3 made by Mr. F. W. Schultz, of Pine Forest, about 1906.

Queen Fan.—A cross between Fan and Carmichael's Eclipse made at Roseworthy Agricultural College which showed high yielding ability, but, owing to its liability to disease, is now losing favor.

Caliph.—Another College crossbred wheat claiming King's White and Marshall's No. 3 as parents. It has proved a very satisfactory variety for the Mallee lands generally.

Currawa.—A relatively late maturing variety which has exhibited a fair amount of drought and rust resistance. It was bred by Mr H. Pye, at Dookie Agricultural College, Victoria, by crossing Northern Champion, Cretan, and Little Club.

Ford.—This wheat was bred at Roseworthy College, the pedigree being Fancy x Crossbred 52. It is very tolerant of soils containing excess lime and has proved of value in the fair quality Mallee lands.

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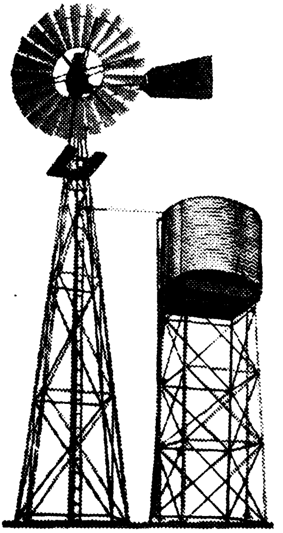

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Sultan.—Sultan represents an attempt to breed a hay wheat yielding good quality solid straw similar in nature to King's White, but one in which the beard of King's had been eliminated. The work was done at Roseworthy by crossing King's White with Caliph, and therefore Sultan comprises three parts King's White blood and one part Marshall's No. 3.

However, whilst the development of a hay wheat was aimed at, a dual purpose variety was secured capable of producing good yields of both grain and hay, but one which is somewhat liable to red rust attack when the infestation occurs early in the season.

Felix.—This wheat is bred on somewhat similar lines to Sultan, being (King's White x Jonathan) x King's White. It is a relatively good grain and hay yielder, and has given satisfactory returns in many parts of the State.

Gallipoli.—Gallipoli and Free Gallipoli have the same origin, the latter being an easier threshing selection from the former. The earlier very tough threshing strain has now been practically discarded, and, therefore, at the present time the prefix "Free" is rarely used.

The parents of Gallipoli are Club Head and Yandilla King. The cross was made by Doctor A. E. V. Richardson, and the variety built up in Victoria.

It is best suited to the more fertile soils of the higher rainfall areas, but it is also markedly drought resistant and has done well in the Mallee lands generally. Gallipoli is the most widely grown wheat in Victoria.

Waratah.—This wheat is the chief variety in New South Wales, and is rapidly increasing in popularity in this State. It was bred in New South Wales by crossing Hudson's Early Purple Straw with Early Gluyas. It is a useful early maturing wheat for the medium rainfall districts.

Nabawa.—Particular atention has been drawn to this wheat in the last few seasons because of its ability to ripen its grain under the adverse finishing conditions which have been experienced. It is the result of a cross made in New South Wales between Gluyas and Bunyip, and the Nabawa strain originating from the crossbred was developed in Western Australia.

An outstanding feature of this wheat is its resistance to flagsmut whilst at the same time it is also fairly rust resistant. It has yielded extremely well in most parts of the State and risen to top position in the areas of varieties planted in both Western Australian and South Australia.

LEADING WHEAT VARIETIES PLANTED IN SOUTH AUSTRALIA.

During the past eight seasons the Government Statist has recorded the areas sown with different wheat varieties in this State. The relative positions of the 12 most extensively seeded varieties is shown in the following tables:—

AREAS (IN ACRES) OF LEADING VARIETIES OF WHEAT SEASONS, 1924–31.

	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Nabawa	—	1,897	6,096	41,678	116,220	288,878	560,626	802,730
Early Gluyas	463,021	474,914	490,590	517,442	621,817	649,915	621,575	570,696
Late Gluyas	212,190	212,198	226,757	273,024	331,737	423,116	444,705	324,751
Federation	408,096	331,756	332,604	372,683	393,293	347,738	374,996	316,266
Gallipoli	—	1,261	3,589	16,621	39,581	72,520	183,280	234,891
Currawa	259,850	284,488	332,177	344,033	325,480	291,012	275,970	210,133
Ford	143,221	248,904	368,408	427,860	376,451	304,296	244,157	203,250
Waratah	—	—	2,167	8,530	26,631	47,677	68,778	141,934
Sultan	58	18,365	38,519	80,314	166,019	184,081	206,649	125,976
Caliph	85,776	102,531	125,521	156,900	165,011	159,066	165,278	105,163
Felix	729	10,229	17,116	33,710	47,876	60,381	96,740	89,145
Daphne	43,621	103,208	128,225	119,901	106,624	109,018	90,903	65,963

RELATIVE POSITIONS OF LEADING VARIETIES OF WHEAT, SEASONS 1924-31.

	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
Nabawa	—	50	38	15	8	6	2	1
Early Gluyas	1	1	1	1	1	1	1	2
Late Gluyas	4	5	5	5	4	2	3	3
Federation	2	2	3	3	2	3	4	4
Gallipoli	—	61	49	25	17	10	8	5
Currawa	3	3	4	4	5	5	5	6
Ford	6	4	2	2	3	4	6	7
Waratah	—	—	53	35	21	17	13	8
Sultan	64	17	13	8	6	7	7	9
Caliph	9	8	7	6	7	8	9	10
Felix	27	25	20	17	14	12	10	11
Daphne	10	7	6	7	9	9	11	12

Reviewing both tables as a whole it will be seen that Nabawa is now the leading wheat, with a total area of 802,730 acres. This represents 18.55 per cent. of the total land seeded to wheat. The increase in popularity of Nabawa is somewhat remarkable, as in eight seasons it has multiplied from a very small plot to the area mentioned. With the exception of season 1931 Early Gluyas has headed the list on every occasion, and over an average of years must be regarded as our foremost variety. If the area is combined with that for Late Gluyas it is seen that these Gluyas strains have occupied upwards of a million acres, or about 25 per cent of the area planted with wheat in South Australia. Late Gluyas and Federation have retained their positions, although in both cases a smaller acreage was seeded than in the previous year. Gallipoli has jumped into prominence, and has moved up from sixty-first to fifth position in six years. Another wheat which has rapidly increased in popularity is Waratah. Very little of the variety was planted in 1925; in fact, the area was so small that it is not recorded, whilst it now holds eighth place with 141,934 acres. Ford reached its peak period in seasons 1926 and 1927 when it was the second most important wheat, totalling 12.27 and 12.87 per cent. of the area cultivated. However, since that time there has been a steady decline in the area seeded, and it now occupies seventh position, or approximately half the area of that seeded in 1927. Currawa, Sultan, Caliph, Felix, and Daphne have also slipped back in positions and acreages, and are being steadily displaced by other varieties.

In all rather more than 200 varieties are listed by the Government Statist, and, therefore, numerous types are being cultivated. However, the 12 leading wheats tabulated represent over 75 per cent. of the area of wheat seeded. Included in the remaining 25 per cent. are many useful older wheats, together with new varieties in the process of development, whilst about 4 per cent. of the total area comprises varieties whose names were not specified on the returns lodged.

Consequently from the point of view of the State, the area seeded with inferior varieties is not particularly important, but in the matter of individual farmers there are a number continuing to plant wheats which are out of date and which could be profitably replaced with improved types.

The only way in which the value of new crossbred or selected wheats can be ascertained is by submitting them to test in various districts under ordinary farming conditions. Therefore, no restriction on the number of varieties planted is suggested, but attention is drawn to the fact that we have too many old type wheats in cultivation which should be abandoned.

Many farmers are loth to discard wheats which have proved successful in the past, and whilst such caution is often justified, the testing from time to time of a new variety which has given satisfactory returns under similar agricultural conditions is to be recommended. The area seeded should not be large, but arranged according to the size of implements available and the convenience of harvesting.

It is obvious that if a variety can be secured which under the same conditions is a better yielder than other varieties, then the annual cash return is increased at practically no additional expense.

Choice of Varieties.

In the foregoing remarks the question of wheat varieties has been discussed in a general way. However, it is recognised that owing to the vastly different agricultural conditions under which wheat is planted in South Australia no single variety is likely to prove universally successful. Therefore, wheats possessing special characteristics must be seeded in different districts in order to give maximum returns under the particular soil and climatic conditions obtaining in each locality. Even on the same farm three or four varieties are usually planted so that the season's work may be distributed according to their rate of maturity.

In order to provide information on the value of different wheats 14 series of variety experiments, including those at Roseworthy Agricultural College, are being conducted by the Department of Agriculture in various parts of the State. As they have been in progress over a varying number of years, it is difficult to draw up a table in which the results from one series are strictly comparative with those from another. However, in the following tables an attempt has been made to group the centres according to their respective soil and climatic conditions, and from that point of view the State has been divided into six sections:—

Yields from Experimental Plots situated in Low Rainfall Districts and on Light Mallee Soils overlying a Well-drained Subsoil.

Veitch. (1922-28).		Sandalwood. (1928-31).		Copeville. (1929-31).		Coorabie (1929-31).	
Variety.	Bush.	Variety.	Bush.	Variety.	Bush.	Variety.	Bush.
Sultan	15·95	Gallipoli	14·00	Canberra	18·08	Daphne	10·73
Walker's Wonder	12·42	Nabawa	12·28	Faun	17·88	Sultan	9·45
Late Gluyas	12·35	Currawa	12·03	Regent	17·15	Canberra	9·00
President	11·70	Gluyas	10·82	Gluyas	16·72	Faun	8·55
Yandilla King	11·35	Yandilla King	10·68	Gallipoli	16·17	Felix	8·00
Baroota Wonder	11·05	Caliph	10·50	Felix	15·92	Gluyas	5·90

The same wheats are not represented in each test, but from the results obtained it would appear that Sultan, Gallipoli, Canberra, Daphne, Nabawa, and Gluyas can be recommended for planting under such conditions. Canberra is an early-maturing Federation crossbred which is able to develop its grain under adverse ripening conditions, and, although susceptible to flag smut, has yielded well on northern Eyre Peninsula.

Yields from Experimental Plots situated in Low Rainfall Districts (under 15in.) and on Light Mallee Soils overlying a Fairly Retentive Subsoil.

Minnipa. (1923-29).		Yurgo. (1928-31).		Kimba. (1927-31).		Rudall. (1927-31).	
Variety.	Bush.	Variety.	Bush.	Variety.	Bush.	Variety.	Bush.
Sultan	17·92	Nabawa	20·18	Gluyas	13·58	Gluyas	12·10
Felix	17·35	Gluford	19·07	Caliph	12·12	Caliph	11·57
Canberra	17·35	Currawa	18·85	Sultan	11·87	Faun	11·48
Faun	17·33	Caliph	18·67	Federation	10·17	Sultan	10·27
Gluyas	17·17	Baldmin	18·02	Ford	9·52		
President	17·17			Currawa	8·45		

In these series Early Gluyas has headed the yields at two centres and maintained its reputation as a very hardy variety. Sultan and Nabawa have also given satisfactory returns, whilst Caliph is well up in the averages.

These four varieties may be regarded as the most valuable wheats for these districts.

YIELDS FROM EXPERIMENTAL PLOTS SITUATED IN LOW RAINFALL DISTRICTS (UNDER 15IN.) AND ON LAND OF RELATIVELY HEAVY NATURE OVERLYING A RETENTIVE SUBSOIL.

Cortlinye. (1928-31).		Brownlow. (1930-31).	
Variety.	Bush.	Variety.	Bush.
Caliph	5·25	Nabawa	8·55
Gluyas	5·02	Begum	7·97
Felix	4·95	Canberra	7·05
Federation	4·80	Sultan	6·93
Yandilla King	4·60	Federation	6·40
Ford	4·35	Gluyas	6·28

Wheat growing under these conditions of soil and moisture is attended with considerable risk, and as far as the Cortlinye plots are concerned a complete failure is recorded for 1929, whilst extremely poor crops were harvested in both 1928 and 1930.

In good seasons high yields are secured from such wheats as Federation and Yandilla King, but on the average the earlier ripening types are to be preferred. From the limited results available no recommendations can be made, but probably Caliph, Nabawa, Gluyas, or Canberra will prove the most valuable varieties.

YIELDS FROM EXPERIMENTAL PLOTS SITUATED IN MEDIUM RAINFALL DISTRICTS (15 TO 17IN.) AND ON LAND TYPICAL OF BETTER QUALITY MALLEE COUNTRY.

Roseworthy College. (1927-31).		Urania. (1929-31).	
Variety.	Bush.	Variety.	Bush.
Sword	21·45	Nawab	25·22
Nawab	19·83	Sword	24·85
Dawn	18·32	Nabawa	24·80
Gluyas	18·32	Caliph	24·03
Regent	18·32	Sultan	23·90
King's White	18·25	Begum	23·17

In these experiments a number of new wheats have been submitted for trial, and it will be noted that two comparatively unknown varieties occupy first and second positions at each centre. These are two very promising wheats well worth testing under conditions similar to those at these centres.

Both were bred at Roseworthy College, Sword being obtained by crossing Sultan with Ford, whilst Nawab claims Anvil (King's White x Jonathan) and Sultan as parents. They are both beardless, white chaffed, relatively drought resistant varieties which are able to thrive in the limestone soils of this State.

Nabawa is not listed amongst the Roseworthy tests, whilst at Urania Ford was omitted in one season, and therefore cannot be included in the averages. However, our knowledge is such that we could recommend both Nabawa and Ford, together with Caliph, for similar districts, whilst Sword and Nawab appear likely to prove at least equal, if not superior, to the varieties mentioned.

YIELDS FROM EXPERIMENTAL PLOTS SITUATED IN GOOD RAINFALL DISTRICTS (17 TO 18IN.) AND ON FERTILE LAND OF THE RED BROWN EARTH CLASS.

Booborowie. (1924–29).		Ungarra. (1927–31).	
Variety.	Bush.	Variety.	Bush.
Merredin	24·28	Faun	28·35
Federation	23·98	Sultan	27·55
Dan	23·47	Gluyas	27·28
Nabawa	21·98	Caliph	27·12
Caliph	21·45	Currawa	26·25
Carrabin	20 90	Ford	25·50

On account of the closing of the Booborowie Experimental Farm no results are available beyond 1929. At that time Gallipoli had only recently been included in the variety trials. At Ungarra it has been tested for two seasons, and in this period has averaged 51lbs. per acre more than Faun, which is shown as the leading wheat.

The highest mean yield at Booborowie was obtained from Merredin, a Federation-Gluyas crossbred that originated in Western Australia. The most prolific wheat in the Ungarra trials was Faun, which was bred at Roseworthy Agricultural College by crossing Late Gluyas with Anvil.

Wheats which may be recommended for this country are Gallipoli, Merredin, and Federation, whilst for later planting Faun, Sultan, and Nabawa would be suitable.

YIELDS FROM EXPERIMENTAL PLOTS SITUATED IN HIGH RAINFALL DISTRICTS (18–20IN.) AND ON FERTILE LAND.

Keith. (1928–31). Variety.	Bush.
Bena	22·07
Sultan	20·62
Federation	18·40
Major	18·20
Dan	17·78

There are not many plots situated on this class of country typical of parts of the Lower North and the Upper South-East of this State.

At present only one series is in progress, namely, those at Keith. Work was commenced at Wolseley with Gallipoli, Federation, Wannon, Bena, Sepoy, Nizam, and Baldwin varieties, but last season the farmer with whom the Department was co-operating was unable to continue the experiment, and consequently no results are available.

Under the conditions obtaining in these districts the wheats seeded must have high yielding qualifications and ability to take advantage of the favorable opportunities offered. In this connection the best wheats appear to be Gallipoli, Wannon, and Federation.

The final division of the State, so far as wheat varieties are concerned, is that relating to those districts receiving a very high rainfall (25in. to 30in. per annum), and where the crop is planted on heavy fertile land. Areas of this nature are to be found in the Lower South-East.

In this locality Major and Crossbred 53 are the principal wheats at the present time, but a small trial is in progress at Millicent, where varieties imported from New Zealand are being planted.

It was considered possible that the types found more satisfactory in the cooler, wetter countries would prove superior to those developed principally for warmer, dryer climates. Consequently, Hunters, Velvet Chaff, and Hard Straw Tuscan were obtained and are now being tested in comparison with Major.

A summary of the position, so far as choice of varieties is concerned, is as follows:—

Gallipoli.—Is well able to adapt itself to a great variety of soil and rainfall conditions. It has high yielding ability, and is able to respond to favorable circumstances. At the same time it is tolerant of light mallee soil and highly resistant to drought.

Nabawa.—Can be generally recommended for our medium to light rainfall country. It possesses the advantage of being resistant to flagsmut and able to ripen grain of good quality under adverse conditions.

Early Gluyas.—Retains its position as the most drought resistant variety. Bearing in mind its relative weakness of straw, Early Gluyas can be recommended for the lower rainfall areas generally.

Sultan.—This variety develops freely in light soils and those containing appreciable quantities of readily soluble lime. It is drought resistant, and is capable of producing high yields of either grain or hay. Whilst not resistant to red rust it usually escapes severe attack from this disease. A useful variety for the medium to light rainfall areas of the State.

Federation.—May still be regarded as the typical high yielding wheat for the good soil and high rainfall districts, particularly those in which steady ripening weather is regularly experienced.

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MALTING BARLEY ON THE FARM AND IN THE MALT HOUSE.

[By A. G. Barrett (Barrett Bros. Pty. Ltd., Maltsters).]

(Paper read at the Forty-third Congress of the Agricultural Bureau, September, 1932.)

The object of this address is to describe some of the characteristics of malting Barley and to show how the malting process takes place.

I am not, therefore, going to deal with soil preparation, seed preparation, and the like, which are better dealt with by the experts of the Agricultural Department, but will start with a few remarks on the barley crop as it approaches ripeness.

As a result of the long experience of many observers, it has been remarked that it is unusual except in specially favorable circumstances to find that Barley of good malting quality is harvested from a crop of more than 25bush. per acre or thereabouts. The reason for this seems to be that a crop which yields heavily has been planted in very fertile soil containing an excess of nitrogen or other plant food, and as a result sends up so many stalks that the moisture in the soil during the ripening period is not sufficient to fill out the grains which remain pinched. These grains will all grow if they are allowed to ripen properly, but they are useless to the maltster, as the nitrogen content of such a sample is usually too high in addition, and he is unable to obtain a malt that will be economical to his customers or to himself.

The nitrogen in barley all comes from the soil through the roots, but the starch or flour is developed from the green flag, and often in a pinched grain the roots have delivered to the ear all the nitrogen they can absorb, and deliver it early in the ripening process, whereas the starch is developed later and cannot be formed if the moisture in the soil fails.

Pinched grain, therefore, is not only uneconomical but usually has an abnormal proportion of nitrogen to starch which cannot be properly dealt with. It follows that at least in the central districts of South Australia barley should not be planted on fallow or on ground which is heavily manured. To do so is to risk failure as regards quality. A seven or eight bag crop can be expected to produce quality grain if it has a September rain to bring the ear well up from the flag and a rain in late October to keep the moisture supply going until the last moment and so fill the grain out properly.

Some damage occurs to the quality of barley if hot winds sweep the crop in October or early November, mainly because such winds shrivel the plants growing in bad soil patches and deprive the ear of its normal moisture. It is a very severe wind, however, which will seriously affect barley growing on good soil, as the roots of such plants can usually pick up enough moisture to repair any temporary drying of the plant. It is my opinion that too little attention is paid by farmers to the types of ground in a paddock, and it is rare indeed for paddocks to be divided up in accordance with the nature of the soil or the lay of the ground. Stony rises are sown and reaped together with flats, grey soil with red, and so on, and the result is that patches of crop damaged by hot winds or burnt by over-rich soil are harvested without any separation whatever and the good quality grain mixed with pinched grain. It follows that buyers will value such a sample at lower prices than a sample which is plump and regular, and in the long run a farmer will average more if he sells a patchy crop in two lots, one of good grain, and the other of pinched. In addition he is practically certain of a sale for the good portion, whereas with an irregular sample he may have the whole of it left on his hands for months, or at best store the line with a merchant for a small advance until it can be disposed of.

The factor which raises the price of a sample of barley above that of feed is its malting quality, and only by consistent attention to marketing the grain in the best possible condition can growers expect to capture the attention of buyers, especially overseas buyers, and raise the prices obtained.

Exporters of barley have the whole world to compete with, and farmers must realise that quality gets the high prices and neither Empire sentiment nor hard luck stories will induce a buyer to pay one penny more than a sample is worth.

Malted barley is used mainly for the production of beer, whisky, gin, vinegar, malt extract, yeast; and certain bakers' products and different samples are required for each; it is impossible to explain how one recognises each type, and it is only long experience which enables a maltster to select the proper line for each purpose. No chemical formula has yet been devised which will satisfactorily replace visual judgment. You may realise, therefore, that differences of selection between buyers may be explained by differing requirements, as well as by the mistakes we all make at times.

Although I cannot explain how to judge quality, I can explain the structure of good quality barley and how the grain is treated in the process of malting, and I will commence by describing a grain and its make-up with the help of

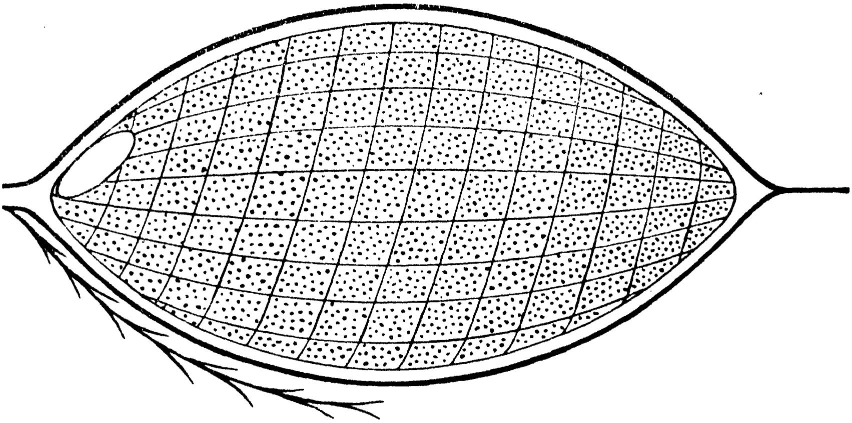

Diagram No. 1.

Diagram No. 1. The husk of barley is in two main parts, the section which covers the back of the grain overlaps the section covering the belly, leaving a passage at the germ end through which the roots protrude at the start of germination. The top half is prolonged at the other end to form the beard. Lying in the crease is a small fibre called the basal bristle, which, however, seems to have no useful purpose and is easily broken off. Underneath the husk is a complete envelope which encircles the germ and the grain proper. This is called the Testa, and it is of such fine texture that it allows nothing denser than water to pass it, and it filters out even matter dissolved in water. This skin keeps the interior of the berry secure from the attack of mould and bacteria, and allows the earliest growth to start with only the materials provided by Nature with, of course, the addition of pure water. Under the testa lies the germ, which is pressed down on the body of the grain but is not attached to it. The body of the grain is merely a storehouse of food for the germ, and supplies the energy necessary to enable the roots and leaf of the growing germ to increase enough to absorb their own sustenance from the soil and air. In malting the growing process is stopped after a certain stage is reached and before much of the food supply of the grain has been used up.

This food is starch and a mixture of gelatine—like substances called albumens. The starch is contained in minute paper—like sacs arranged in the manner of a honeycomb, and the whole of this portion is impregnated with the albumens. The chief object of the maltster is to dissolve the sacs enclosing the starch granules and to alter the albumens, making some of them soluble in water, some nearly soluble, and to leave untouched the remainder.

In the ripe grain just underneath the germ a small layer of ready formed plant food is provided which enables the germ to commence growth when sufficient water has been absorbed. Directly this process commences the germ secretes two main types of matter which attack and dissolve the albumens and the starch enclosing sacs. These two substances diffuse slowly until they have travelled the whole length of the grain, the inert albumens and the starch sacs being changed into soluble forms which become the food supply of the growing plant. In the paddock the whole of the grain is dissolved and made available to the growing roots and leaf, and only the husk remains. In malting, however, it is necessary to retain as much as possible of the starch, and it is not economical to use more than about 15 per cent. of the dry substance of the grain. After cleaning and grading a line of barley, it is soaked in water until it is soft, a process which takes from 30 to 60 hours, according to the season of the year; the water has to be changed frequently to prevent putrefaction and also to enable the grain to be aerated, as it is necessary for the germ to breathe air in order to keep it alive.

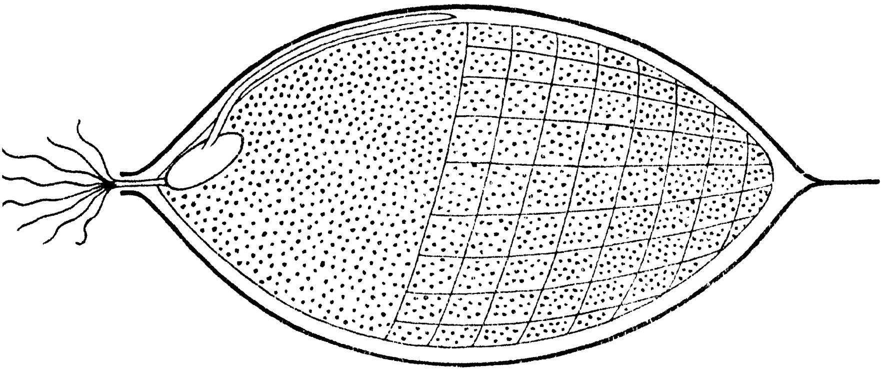

Diagram No. 2.

The soaked and swollen barley is then dropped on to growing floors and allowed to rest in fairly thick layers until the roots protrude. These burst through the fine underskin and follow the channel provided by the junction of the upper and lower husks. Most of the water absorbed by the grain in soaking enters through this same channel. Shortly after the roots show up, the first stalk of the plant commences to grow out of the germ. This also bursts through the underskin and grows up between it and the husk. As growth proceeds the change in the structure of the grain commences, and after three or four days portions of the berry are dissolved as shown in Diagram No. 2. You will see that the paper-like sacs nearest the germ have disappeared leaving the starch granules free to be acted upon by another substance which is formed as time goes on. This substance is called diastase, and its formation and regulation is the crux of the malting process.

It cannot be shown in the diagram, but at the same time the albumens are being changed into soluble forms, and the whole of the products of the gradually dissolving berry pass into the germ and are used by it to form the roots and leaf or stalk. At this stage the stalk has grown about half way along the grain and about five roots have lengthened out from the germ. During the process of growth a good deal of water is used up and must be replaced by sprinkling from cans or hoses, and this water is taken into the grain by the roots, in the same way that they extract water from the soil after rain.

As the barley grows a good deal of heat is generated by the chemical processes which are going on inside the grain, and it is necessary to keep the heaps cool either by turning them over with shovels or by currents of cold air or both. The turning of the heaps stops the roots from matting and becoming interlocked into a solid mass. After six to nine days the growth stops on account of much of the water in the grain having been used up, the roots wither, and the stalk practically stops growing. Diagram No. 3 shows the state of the grain at this period. Six or seven roots have been formed, the stalk has reached nearly the end of the berry, and all the paper-like sacs have been dissolved away, leaving the starch loose and free. From 30 to 40 per cent. of the original albumens have been rendered soluble or semi-soluble and the moist white portion of the grain is in a mealy condition instead of the elastic rubbery state it was in before growth started. The heaps of green malt are then loaded on to kilns and dried with hot air. The drying heats are arranged to add the required aroma, flavor, and color to the malt, and these qualities in malt made for brewing are imparted to the beer.

There are several different types of substances formed from the albumen of barley, all of which affect the products which are made from malt. The color and aroma referred to come from the albumens, as does the food for the yeast employed in fermentation, but perhaps the most important is diastase, which I mentioned a little while back. It is this substance which transforms the starch of the grain into sugary matter which can be fermented by yeast, and one of the major objects of the malting process has been to create diastase in the malt and to remove the paper-like sacs which would prevent the starch they contain being dissolved by the diastase. When the malt is dried on the kiln the husk of the grain has become merely a container of diastase, starch, and soluble albumens which later are put to their final uses in the brewery, malt extract works, or elsewhere. So far we have dealt with a perfect grain, but it should be realised that different seasons bring different qualities of barley and different problems for the maltster. South Australian barley is esteemed in England mainly because it is sun-ripened and so provides a type of malt which replaces certain deficiencies in the European types, which are usually harvested in wet weather.

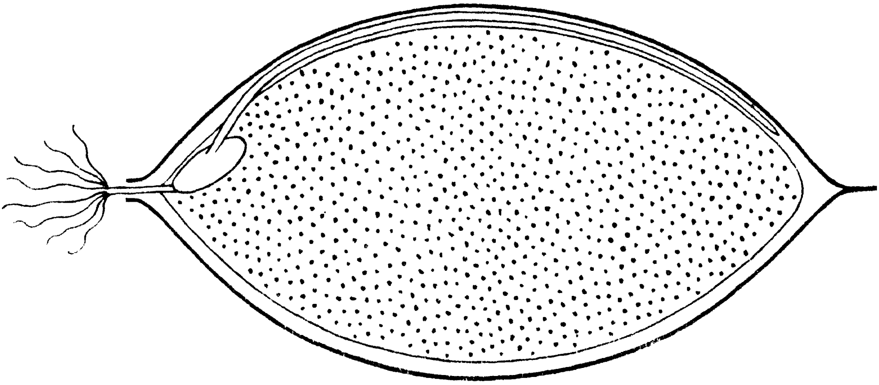
Diagram No. 3.

If our barley is properly treated by the grower every grain of it will grow, and this is its great attraction overseas. This phase of production has been neglected by many growers, and I have no hesitation in giving my opinion that when growers deliver to exporters and local users barley in the best possible condition they will average at least 6d. per bushel more as compared with grain marketed as it is now. The practice of delivering inferior barley even in small quantities and having it accepted by an agent either by bullying or trickery has cost the local farmer many thousands of pounds. It must be realised that every bag of barley is opened separately and a user soon knows where he is to look to find faults. There are some districts in South Australia from which I will not buy direct as I know I will be taken down, and some farmers from whom I will not buy for the same reason. When inferior barley gets into a large stack it is almost impossible to successfully remove it, if only on account of cost, and when say, an overseas user opens bag after bag of pinched or damaged grain he will avoid the risk of making similar purchases again, or if he does, only at a price far below the true value of the line to protect himself against further inferior deliveries. The English barley market has been practically closed to Australia on account of careless marketing, and it is only the improvement in the last couple of years that is drawing English attention again. The qualities which go to make a good sample and which are in the control of the farmer are fairly well known, and the first of them is the ripeness of the grain. Barley needs complete ripeness to allow it to grow and behave at its best, unripeness leads to uneven germination and inferior malt. If green patches are cut in an otherwise ripe crop sweating and heating may take place, and this will nearly always destroy the life of the grain and reduce its value to that of feed. Any suggestion of heating is regarded as suspicious by a maltster, who will never take a risk about barley which may not grow properly. Similarly, barley which has been badly wetted will grow unevenly and produce poor malt. Crops, therefore, should not be harvested until they are ripe, and the bags of barley should not be put on damp soil nor left in the paddock longer than necessary.

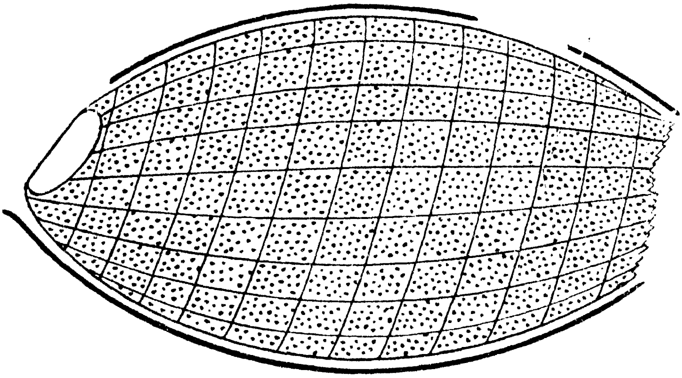

Diagram No. 4.

If lines cannot be carted promptly they should be stacked on dunnage and sewn. The filled sacks should be turned after rain several times, as otherwise the sewn end may become damaged after the bags have been up-ended. If barley has to be stored it should be in as airy a store as possible, as when it is stored in a close atmosphere weevil develops rapidly, does immense damage, and causes great loss of weight. New sacks should always be used, as second-hands rarely stand stacking and transport, with waste as a result, and in addition, they convey weevil to the stacks, with often disastrous results.

Anything which induces uneven germination depreciates the value of a sample, and in addition to the tendency to cut barley before it is ripe, a great cause of irregularity lies in the damage grain is carelessly subjected to during harvesting.

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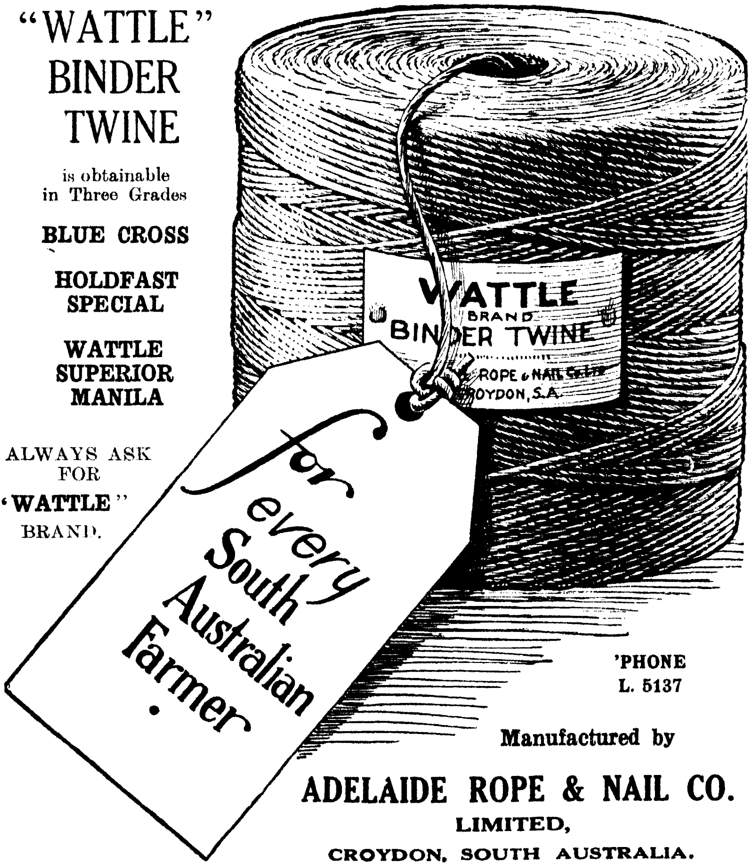

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I have already explained how germination proceeds, and I will now show, with the aid of Diagram No. 4, how damage affects growth. You will recollect that the underskin is impervious to anything but pure water, and that most of the water absorbed by the grain in the first stage of malting enters by the channel formed by the junction of the two sections of husk. It can be seen, therefore, that in perfect grains the entrance for water is roughly the same size, and as a matter of fact the water spreads between the husk and underskin and passes into the berry over its whole length, both ends becoming soft more or less at the same time. But if some of the husk is removed during harvesting the entry for water is much enlarged, and a damaged berry will absorb much more water in the same time than a perfect grain. In a bad case the grain will become water-logged and die, or if not, will grow in a different manner from the bulk of the line and make irregular and therefore inferior malt, as the growth of the damaged grains cannot be controlled. If, in addition to the husk, the underskin is broken, the risk becomes greater, and such grains are nearly always killed by drowning. When a grain is broken or severely skinned, the interior is deprived of its natural protection and moulds and bacteria attack it, putrefaction sets in and imparts undesirable characteristics to the grain, especially as to flavor and aroma, which become very pronounced in beer and other products, the result being that people refuse to buy them. Hence mouldy malt cannot be sold, and maltsters will not buy broken barley which always carries the risk of mould. You will see too that if a grain will not grow it cannot be made into malt, and remains unchanged through the process. This, both economically and for other reasons, is undesirable, and malt containing much dead grain cannot be sold. It often happens that the back of the barley is scraped between the beaters during harvesting, and if this causes damage to the germ the loss of value of a sample may be serious indeed. Where this occurs the remaining portion of the germ secretes its substances, but as there is no root nor leaf, all the plant food formed becomes available to moulds and bacteria, with the result that the grain goes rotten and contaminates the whole of the malt. Such malt cannot be sold, and therefore barley affected by this form of damage cannot be bought except at low prices for feed.

Owing to the variation in the type of machines used and the differing daily temperatures, farmers around Adelaide are unable to get perfectly harvested barley, and local maltsters have to cope with a few damaged grains in each sample, but if a line contains more than 5 per cent. of badly damaged stuff it is considered unsuitable for malting, and it has to be sold at lower prices for other purposes. English buyers require grain that is practically perfectly harvested.

A perfect sample is one which ripened on the straw, has been properly stored, and which is free from damaged corns. It must be plump, regular, and mealy, free from oats, wheat, seeds, or any other foreign matter. Grain which has a steely, hard, or transparent look is unsuitable for malting, and short, round corns are usually preferred to those which are long, flat, and without a pronounced belly. Samples for malting look best when they have about one thirty-second of an inch of head remaining on the grain, but if it is impossible to take all the beard off without skinning, leave a little beard and avoid damage. If a line is obviously pinched and unsuitable for malting, it is not necessary to harvest it so carefully as beards are not wanted in a feeding line. The highest prices paid for barley are paid for the malting lines, and if growers seize the present opportunity and market their grain in the condition desired by buyers, especially those overseas, they will add to the value of their crop and secure a constant market in Europe, where the value of South Australian barley is just being realised.

Should a grower be in doubt on any point or desire information at any time, an inquiry from one of the reputable buyers will always bring a valuable reply, and the exchange of knowledge cannot fail to raise the standard of quality of this very profitable product.

INSECTS OBSERVED ON CROPS IN SOUTH AUSTRALIA DURING THE PERIOD JUNE, 1930, TO JUNE, 1932.(1)

[By J. DAVIDSON, D.Sc., F.E.S. (Waite Agricultural Research Institute, University of Adelaide).]

1. CEREAL CROPS.

Larvae of the Noctuid moth (*Cirphis unipuncta Haw.*) caused damage to self-sown barley in a local area in the South-East, but did not spread to the adjoining cereal crop.

2. PASTURE AND FODDER CROPS.

The "Lucerne flea" (*Sminthurus viridis* L.) was generally active a month earlier in 1932, owing to the early autumn rains. The insect demands a high humidity in its surroundings, and the moisture in the surface soil is the most important factor affecting these conditions (*see* Davidson, J.: Australian Journ. Expt. Biol. and Med Sci. 1932, Vol. X, pp. 1-16). Certain of the eggs remain viable in the dry surface soil during the summer months and hatch in autumn when the temperature and soil moisture are favorable (*see* Davidson, J.: Australian Journ. Expt. Biol. and Med. Sci. 1932, Vol. X., pp. 65-88). In the Adelaide hills district, in low-lying damp areas, active individuals may be noted until December. In similar situations the over-summering eggs were hatching out towards the end of February in 1932. Lime sulphur—1gall. in 60galls. of water—is an effective spray. The crop should be cut short or close-grazed before treatment. The first application should be given three to four weeks after the insects commence to hatch in the autumn, before they lay eggs. This will reduce the numbers in the next brood.

Certain of the reclaimed swamp areas on the River Murray were inundated by flood waters for several weeks during 1931. As a result, these areas had to be replanted after the floodwaters were pumped out. In one area which was replanted with lucerne in November, 1931, after being inundated from September 3rd, 1931, to the end of October, *S. viridis* was abundant in the crop by April, 1932. In certain other areas which had been submerged for longer periods, a few of the insects were observed in the new crops the following July. In every case the areas concerned had been infested with the insect prior to the floods. These observations indicate that certain of the eggs can withstand immersion for long periods, which is supported by the following experiment. On July 27th, 1932, a number of egg batches (estimated at about 10,000 eggs) laid on soil during the previous 14 days, were covered with about 6in. of water and left in the insectary. The eggs were in various stages of development. A number of the eggs hatched during the first two or three days, and the young insects floated up to the surface of the water. On September 7th, after being submerged for six weeks, the remaining water was poured off and the soil allowed to dry. A number of young individuals hatched out during the next few days, showing that eggs which had undergone considerable development survived the long period of immersion.

Weekly counts of the population of *S. viridis* in a plot of infested lucerne (about 1¼ acres) at the Waite Institute were made during 1932. On April 29th the total number of individuals in an area consisting of three samples (each sample 6½in. diam.) was 926. On May 20th, when a new generation was hatching out, it was 2,413. An account of these experiments will be published later.

Certain other species of Collembola occurred sparingly in the samples, notably *Isotomurus palustris* Mull. and *Katianna australis* Womersley (2)

A Bdellid mite (*Scirus longirostris*) occurred sparingly. It is of interest to note that Newman and Womersley (Journ. Agric. Western Australia, 1932, Vol. IX., No. 2) refer to another Bdellid mite (*Biscirus lapidarius*) as an active predator on *S. viridis.*

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(1) The first records were published in this Journal, 1931, Vol. 34, pp. 741-745.

(2) I am indebted to Mr. H. Womersley for identification of the Collembola and mites recorded in this paper.

The red-legged mite of Western Australia (*Halotydaeus destructor* Tucker) and the red-legged or blue oat mite of Eastern areas of Australia (*Penthaleus bicolor* Froggatt) also occurred sparingly in the crop.

3. Field and Market Garden Crops.

The potato moth (*Phthorimaea operculella* Zeller) caused damage to tomato plants in a glasshouse near Adelaide in June, 1931. The eggs are laid on the leaves and the caterpillar burrows down the stem. Removal of affected plants is necessary.

Young onion plants in two gardens on the Adelaide plains were found to contain numerous maggots of the fly *Chortophila* (*Crinura*) *florigera* Zett. The fly was kindly identified by Mr. A. L. Tonnoir, who stated it was recorded by Malloch as *Hylemyia crinura*. The maggots were in the bulb portion of the onions, which were hollowed out and decaying. Attempts to get the fly to lay eggs on the plants failed. It may be that the presence of the maggots was secondary and not the original cause of the condition of the onion plants.

A local occurrence in mass numbers of the Rutherglen bug (*Nysius vinitor* Berg.) in a crop of linseed near Adelaide was recorded in January, 1931. In December the pest caused damage in certain areas in the South-East on turnips, carrots, parsnips, and potatoes. The Harlequin bug (*Dindymus versicolor* H.Sch.) occurred in plague numbers at Myponga in January and February, 1932, chiefly on potatoes and vegetables generally.

The red-legged mite (*Halotydaeus destructor* Tucker) occurred as a pest of seedlings in October and November, 1931, on nursery beds near Glenelg. It was recorded as causing damage to French beans, cucumbers, pumpkins, and tomatoes in certain districts in the South-East in October, 1931. Specimens were not submitted, but it is probable that the species in this latter case was *Penthaleus bicolor* Froggatt.

4. Fruit Crops and Vines.

The losses in the apple crop due to codlin moth (*Cydia pomonella* Linn.) in different years are associated with the alternating years of light and heavy cropping and the fluctuations in the moth population. With a normal codlin moth population the percentage of affected fruit generally will be higher in a light cropping year. The crop in 1930-31 was a light one, and losses due to this pest were more in evidence in some districts. Pears were heavily attacked in February and March in certain mid-northern districts which Mr. J. Harris, the district instructor, attributes to the light apple crop. In 1931-32 the codlin moth infestation was much lower than usual, and a heat wave in January evidently further weakened the second brood, since a fair proportion of dead larvae were found in tree bandages. The observations carried out by Mr. R. Fowler at Blackwood Experimental Orchard and by Mr. J. Harris in mid-northern districts show the value of baits as a guide to the timing of spray applications (see *Journ. Agric.*, South Australia, 1931, vol. 35, p. 222). Experiments on the value of white oils in the spraying programme against codlin moth are discussed by Mr. R. Fowler (*Journ. Agric.*, South Australia, 1930, vol. 34, pp. 354-368, and 1931, vol. 35, pp. 306-314), and by Mr. J. Harris (*Journ. Agric.*, South Australia, 1931, vol. 34, p. 829).

The silver striped vine moth (*Hippotion celerio* Stephens) was noted in South-Eastern districts. Larvae of the light brown tortrix (*Cacaecia postvittana* (Walk.) occur occasionally in grape bunches. Occasionally the rind of the orange is marked by the caterpillar of this species (see Davidson, J., *Journ. Agric.*, South Australia, 1932, vol. 35, p. 1381).

The cherry and pear slug (*Caliroa limacina* Retz. = *cerasi* Linn.) was recorded for the first time as a pest in South-Eastern districts in November, 1930.

The cherry green beetle (*Diphucephala colaspidoides* Gyll.) occurred in large numbers in the Glencoe district in November, 1930. Plum foliage suffered chiefly, but other fruit trees also. The pest did not recur in 1931. The curculio beetle (*Otiorhynchus cribricollis* Gyll.) was prevalent in both years. It caused damage to young citrus in southern districts in February, 1932, and was particularly prevalent on the Adelaide plains.

The following species of weevils are referred to by A. M. Lea (*Journ. Agric.*, South Australia, 1927, vol. 30, pp. 582-598) as occurring from time to time as pests of fruit trees in South Australia. *Otiorhynchus sulcatus* Fabr. appears to be restricted to the Mount Lofty Ranges, where it occasionally attacks apple trees. *Polyphrades longipennis Pasc.* sometimes feeds on the tips of apple twigs.

The elephant beetle (*Orthorhinus cylindrirostris* Fabr.) attacks the orange, peach, and apricot. The larvae tunnel in the branches, and the roots of young trees may be affected.

The strawberry weevil (*Rhinaria perdix* Pasc.) feeds on the flowers, fruit, and crowns of strawberry plants, the affected leaves having small holes eaten through them; the larvae tunnel in the stems of the plant. A small species (*Neomerimnetes australasiae* Faust.) sometimes feeds on the buds and leaves of strawberry plants in the Mount Lofty Ranges.

The apple blossom thrips (*Thrips imaginis* Bagnall) occurred in plague numbers throughout the orchard and vine districts during the spring of 1931. Late flowering varieties of apples like Rome Beauty suffered severely, but early varieties like Cleopatra largely escaped damage as they blossomed before the period when the peak emergence of the thrips occurred. Berry fruits also suffered heavily. Vines were heavily infested in November and December, but there was no definite evidence that the setting of normal bunches of grapes was seriously affected. The present position regarding the thrips problem in Australia is discussed by J. W. Evans (Commonwealth Coun. Sci. Ind. Res., 1932, pamphlet No. 30). *Isoneurothrips australis* Bagnall and *Thrips tabaci* Lind. commonly occur during winter and early spring.

In the Light's Pass district the return migrants of the green peach aphis (*Myzus persicae* Sulzer) were more numerous than usual in May. Eggs were present in the axil of the buds on the peach trees the following month, and isolated hatched individuals were found during July. This pest occurs generally throughout the State, but usually the infestation on the trees is light. Occasionally the outbreak is severe as in the spring of 1928-29. Winter oil sprays will control the pest by destroying the overwintering eggs. There is evidently a combination of factors which bring about a heavy spring infestation on the trees in occasional years.

The woolly aphis parasite (*Aphelinus mali* Hald.), which was first introduced into the State in 1926 at Blackwood Orchard, is now well established in certain of the cooler areas of the State, but appears to have difficulty in becoming established in the warmer mid-northern districts.

The harlequin bug (*Dindymus versicolor* H. Sch.) occurred in plague numbers in certain districts in the South-East during September, 1930.

The Rutherglen bug (*Nysius vinitor* Berg.) is generally present over a wide area. It causes some damage to apricots, peaches, nectarines, and is frequently in numbers amongst vines. It appears to be more destructive when early, dry summers occur.

The pear leaf blister mite (*Eriophyes pyri* Pagenstecher) occurs on some varieties of pears. It was in evidence in certain areas in the southern district.

The relation of certain insects to surface blemishes of oranges in the season 1931-1932 is discussed by J. Davidson (*Journ. Agric.*, South Australia, vol. 35, pp. 1381-1387).

5. MISCELLANEOUS OBSERVATIONS.

By means of trapping records made throughout the year at the Waite Institute, the following species of flies have been found to be the prevalent blowflies in the district:—*Calliphora stygia* Fabr., *C. augur* Fabr., *Microcalliphora varipes* Macq., *Achaetandrus* (*Chrysomyia*) *rufifacies* Macq., and *Lucilia sericata* Meigen. *Calliphora fulvicoxa* Hardy and *C. rufipes* Macq. also occur in small numbers.

The total catch of flies in the traps in the pasture areas on the hill slopes was small compared with the numbers taken in traps situated near to the sheep yards, which indicates the value of placing traps near to situations where sheep congregate.

The moth *Monopis ethelella* Newman was found infesting the soiled portions of two stored fleeces.

The beetle *Aphodius hourtii* Hope occurred in flight in large numbers in certain districts in the South-East on the night of February 9th, 1932.

The mite *Tydeus foliorum* Koch. commonly occurs on oranges on the trees, but appears to be a scavenger and not harmful to the fruit.

The sugar ant (*Iridomyrmex rufoniger* Lowne (¹)) infested a species of *Lagunaria* in the Waite Arboretum in February in both years. The bark on the young twigs was removed in places and their growth affected.

The pine chermes (*Pineus pini* Linn.) occurs on *Pinus insignis* and appears to check the growth of shoots on young trees.

The mite *Pediculoides ventricosus* Newp. was isolated from a sample of hay received from a district in which workers handling hay and chaff complained of "hay itch." Only a few females were obtained.

The dried fruit mite (*Carpoglyphus lactis* Linn. = *passularum*) was found infesting stored prunes.

The chicken mite (*Dermanyssus gallinae* DeGeer) occurred in large numbers in a vacant room. The mites were emerging through the floor boards; the cause of the infestation was evidently due to the presence of pigeons nesting under the floor at one end of the room.

A SMALL SHEARING SHED.

The accompanying illustration shows two plans—one a general lay-out showing forcing yards, sweating pens, &c., in relation to the shearing shed; the other plan showing suggestions for the lay-out of the woolclassing portion of the shed.

Two main ideas have been kept in view in planning this shed; the first being the easy handling of the wool from the time it is taken off the sheep until it leaves the shed in bales; the other being simplicity in the form and construction of the buildings.

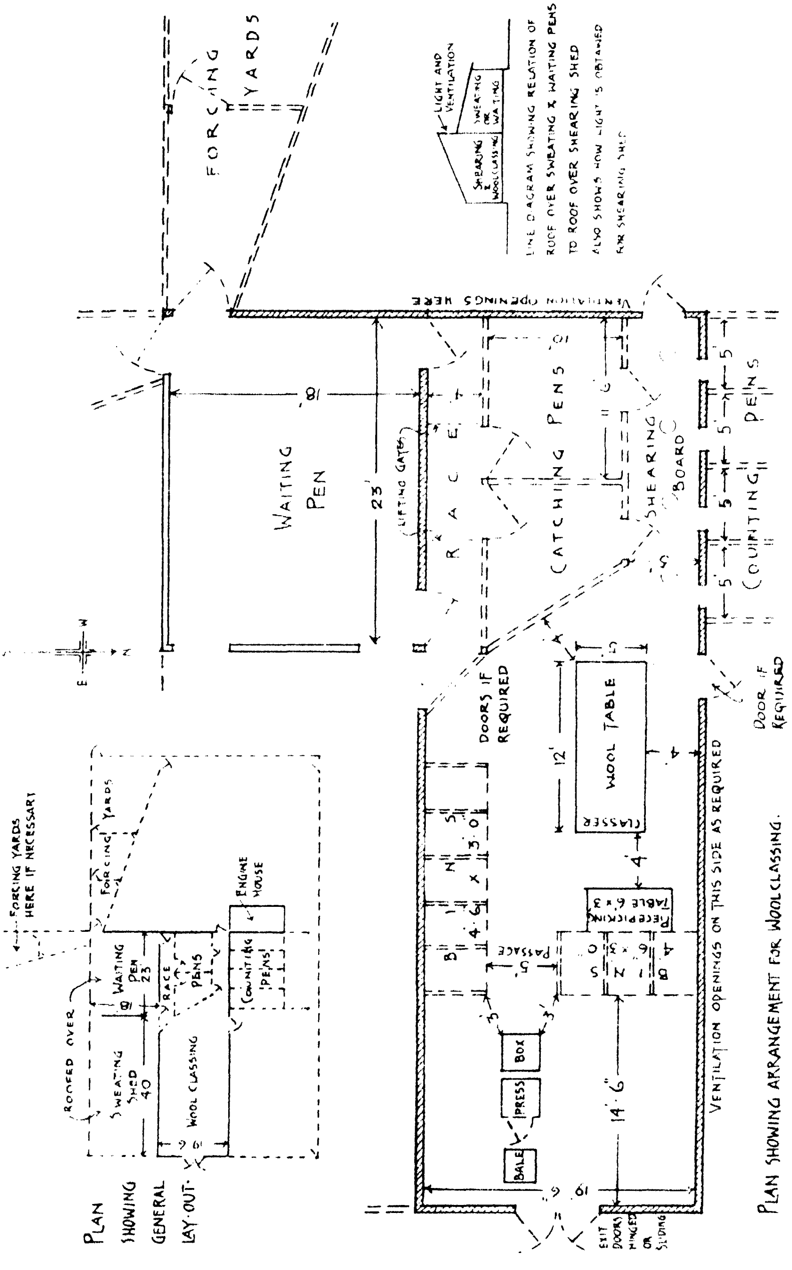
On the general lay-out plan it will be seen that the forcing yards can be placed either on the west or south side depending on local conditions. From the yards the sheep can be fed into the waiting pen or sweating pen, both of which would be covered with a lean-to roof as shown on the line diagram. The race can be supplied from the waiting pen of the sweating shed. From the race the sheep pass in to the pens to await the shearer. One pen to two shearers is shown.

The plan of the shearing shed shows positions for four sheares on the shearing board, with the counting pens alongside. Should the machine method of shearing be adopted the engine house can be placed as shown on the lay-out plan. Close to the shearing board is placed the wool table with the classer at one end. If desired, a separate table could be provided for the classer, and the wool table as shown reduced in size. Conveniently placed in relation to the wool table and wool press are the bins for the fleeces. A piece-picking table is shown in conjunction with a series of bins, which are also convenient to the wool press. Sufficient space is shown for operating the wool press and for the storage of bales if necessary. Exit doors for leading purposes are placed at the end of the shed. It will be seen that the wool is kept going in one direction from the time it leaves the shearing board until it passes from the shed in bales.

The area embracing the woolclassing, shearing board, pens, and race would be enclosed and covered with a roof of the saw-tooth type as shown in the small diagram. Light and ventilation would be obtained from the south side above the lean-to roof over the sweating shed.

(¹) Kindly determined by Mr. J. Clark.

The drawings have been prepared by Mr. T. A. Macadam, Lecturer in Building Construction at Roseworthy College, in conjunction with Mr. A. H. Codrington, Lecturer in Woolclassing, to illustrate the ideas suggested in this article.



AGRICULTURAL EXPERIMENTS IN SOUTH AUSTRALIA.

[By R. C. Scott, Supervisor of Experimental Work.]

(Continued from page 32.)

EXPERIMENTS IN THE MURRAY MALLEE.

The experimental plots in the Murray Mallee are situated at three centres, namely, Sandalwood, Copeville, and Yurgo. The agricultural conditions are a little different at each place, more particularly regarding the character of the subsoil, and therefore the results obtained are of special local interest. Experiments in progress consist of variety and manurial trials, whilst at Yurgo an additional series is included in which wheat is grown in rotation with lucerne seeded in the wheat stubble for grazing purposes.

During the course of the year inspection days have been arranged by the local Agricultural Bureaux, and visitors have had opportunity of noting the work being carried out. Keen interest has been shown both by the experimenters themselves and the Bureau members generally, and it is felt that results of value to the districts are being secured.

EXPERIMENTS AT SANDALWOOD.

CONDUCTED ON THE PROPERTY OF MR. K. A. BOWMAN.

The district of Sandalwood is approximately 120 miles east of Adelaide, and the plots themselves are about three miles north of the Sandalwood Railway Station. The nearest township of any size is Karoonda, which lies about 20 miles distant in a south westerly direction. The natural mallee timber is of medium size, and consists chiefly of *Eucalyptus oleosa* and *dumosa*.

The soil is of variable nature, but on the whole is of relatively light texture overlying a free-draining sub-soil, with some heavier flats and limestone outcrops. The experiments have now been in progress for five seasons, and as that was the term agreed upon, this constitutes the final report on the plots conducted by Mr. Bowman. During the five year period Mr. Bowman has been an interested and careful experimenter, and we take this opportunity of thanking him for his assistance.

Rainfall at Sandalwood.

	1927.	1928.	1929.	1930.	1931.	Means. 1927-31.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January	0·71	0·91	0·57	0·00	0·45	0·53
February	0·65	1·78	0·39	0·40	0·16	0·68
March	0·45	1·19	0·22	0·09	0·76	0·54
April	0·03	0·36	0·28	0·58	1·20	0·49
May	0·86	1·12	0·85	1·35	1·72	1·18
June	0·60	1·75	1·48	0·55	2·70	1·42
July	1·37	1·01	0·77	2·09	1·33	1·31
August	1·23	0·33	0·62	2·23	1·94	1·27
September	0·87	1·37	1·34	0·84	1·58	1·20
October	0·31	1·79	0·45	2·46	0·42	1·09
November	0·69	0·03	0·98	0·45	0·73	0·58
December	0·48	0·36	2·55	1·28	0·28	0·99
Total	8·25	12·00	10·50	12·32	13·27	11·28

Useful Rainfall.

	1927.	1928.	1929.	1930.	1931.	Means, 1927-31.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
Seeding Rains (April-May)	0·89	1·48	1·13	1·93	2·92	1·67
Winter Rains (June-July)	1·97	2·76	2·25	2·64	4·03	2·73
Spring Rains (August-October) ..	2·41	3·49	2·41	5·53	3·94	3·56
Early Summer Rains (November)	0·69	0·03	0·98	0·45	0·73	0·58
Total	5·96	7·76	6·77	10·55	11·62	8·54

For the five years during which these plots have been in progress the rainfall has averaged 11.28in. per annum. The mean for the district taken over an eighteen-year period is approximately 14ins. per annum, and therefore the experimental crops have been produced under a fall of about 2¾ins. below the mean. The best years have been 1930 and 1931 with 12.32 and 13.27ins. respectively, whilst 1928 was fairly satisfactory as far as total rainfall is concerned with 12ins.

With regard to the Useful Rainfall, the average for 1927-31 is 8.54ins., but this is also considerably below the mean when the fall is calculated over a longer period. 1927 was a low rainfall year generally, whilst 1928 was characterised by heavy summer and light late winter and early spring rains. In each of the remaining years there was one critical month which caused appreciable depreciation in the crop returns, namely, August of 1929, September of 1930, and October of 1931. Therefore over the whole period the rainfall conditions cannot be regarded as altogether satisfactory for the carrying out of agricultural experiments.

Manurial Experiments, Sandalwood.

	No Manure.	½cwt. 45 Grade Super. (11½lbs. P_2O_5).	1cwt. 45 Grade Super. (23lbs. P_2O_5).	1½cwts. 45 Grade Super. (34½lbs. P_2O_5).	2cwts. 45 Grade Super. (46lbs. P_2O_5).	3cwts. 45 Grade Super. (69lbs. P_2O_5).
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
1927	3 10	3 43	4 47	4 16	4 28	4 23
1928	3 39	10 7	12 9	12 42	14 6	13 49
1929	1 49	5 24	7 22	9 18	11 13	12 48
1930	11 23	14 35	17 55	19 49	21 45	22 25
1931	5 47	8 57	11 47	14 10	14 48	14 59
Means	5 10	8 33	10 48	12 3	13 16	13 41
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Value at 3s. 4d. per bush.	0 17 3	1 8 6	1 16 0	2 0 2	2 4 3	2 5 7
Net value with super. at 5s. per cwt.	0 17 3	1 6 0	1 11 0	1 12 8	1 14 3	1 10 7

Examination of the above results shows that with the exception of seasons 1927 and 1928 increased yelds have regularly followed heavier phosphate applications. In the two years mentioned the differences were not great, the averages for the five-year period indicating that the highest return has been harvested from the 3cwt. plot and the lowest from that receiving no manure, with regular improvement in yield for the intermediate dressings. The additional return following the application of the first ½cwt, of superphosphate has been 3bush. 23lb., with 2bush. 15lb. for the second, 1bush. 15lb. for the third, 1bush. 13lb. for the fourth, and 25lb. for the final 1cwt., constituting the 3cwt. dressing. The average returns therefore are 5bush. 10lb. for no manure, 8bush. 33lb. for ½cwt. of superphosphate, 10bush. 48lb. 1cwt. superphosphate, 12bush. 3lb. 1½cwt. superphosphate, 13bush. 16lb. 2cwt. superphosphate and 13bush. 41lb. for 3cwt of superphosphate. If these yields are reduced to a cash basis by allowing 3s. 4d. per bushel as the value of wheat and 5s. per cwt. as the cost of superphosphate, the highest nett return, namely £1 14s. 3d., has been secured from the area receiving 2cwts. of superphosphate per acre. Whilst the 3cwt. plot has given the maximum grain yield, the increase has not been sufficient to meet the cost of the additional fertiliser applied, and the net value of the crop so manured is approximately equal to that from the 1cwt. dressing.

The returns from the 1cwt. 1½cwt. and 2cwt. superphosphate applications do not vary to a great extent being £1 11s., £1 12s. 8d., and £1 14s. 3d., respectively. Therefore, the limit for profitable phosphatic manuring would appear to lie somewhere within the vicinity of 1½cwts. 45 grade superphosphate per acre.

Wheat Varieties, Sandalwood.

	1928.		1929.		1930.		1931.		Means. 1928-31.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Gallipoli	12	42	9	18	19	49	14	10	14	0
Nabawa	10	22	5	53	18	9	14	43	12	17
Currawa	12	49	5	22	15	50	14	6	12	2
Gluyas	10	21	5	45	15	59	11	12	10	49
Yandilla King	10	52	5	38	16	19	9	55	10	41
Caliph	9	55	6	10	13	30	12	26	10	30
Sultan	9	20	6	29	14	8	11	27	10	21
Ford	10	31	5	24	12	33	10	29	9	44
Daphne	10	38	5	20	12	55	9	42	9	39

As the varieties Nabawa and Caliph were not included in the 1927 experiments the yields for that year have not been included, and the means are calculated over the four-year period 1928-1931.

Gallipoli has headed the returns with 14bush. per acre, and is practically 1¾bush. ahead of any other variety. This wheat has yielded well throughout the mallee areas, almost invariably producing more grain than the appearance of the crop would lead one to expect, and appears able to respond under a great variety of soils and climatic conditions. The second position is occupied by Nabawa with an average of 12bush. 17lbs., followed by Currawa with 12bush. 2lbs. per acre, whilst the remainder have yielded considerably less.

From the above results it is evident that Gallipoli and Nabawa are the most valuable wheats for this district.

COPEVILLE EXPERIMENTAL PLOTS.

CONDUCTED ON THE PROPERTY OF MR. G. H. SUTHERLANDS.

Copeville is situated about 25 miles north of Karoonda and 20 miles north-west of Sandalwood. Whilst various classes of soil are to be found in the district, that which predominates carries a higher proportion of limestone than the general average of soils in the locality of Sandalwood. In addition the rainfall is somewhat less.

The experiments being conducted consist of wheat variety trials, manurial experiments relative to the optimum dressing of superphosphate, and rate of seeding tests; whilst this season small demonstration plots of various pastures have been seeded in order to ascertain their value under these conditions.

Rainfall at Copeville.

	1929.	1930.	1931.	Means.	
				1929-31.	1912-31.
	Ins.	Ins.	Ins.	Ins.	Ins.
January	0·18	0·00	0·42	0·20	0·35
February	1·61	0·44	0·07	0·71	0·76
March	0·13	0·03	0·89	0·35	0·69
April	0·21	0·28	1·30	0·60	0·44
May	0·88	0·81	1·55	1·08	1·28
June	1·06	0·60	1·77	1·14	1·39
July	0·64	1·20	0·71	0·85	0·96
August	0·59	1·86	1·31	1·25	1·25
September	1·49	0·84	2·02	1·45	1·57
October	0·36	2·37	0·62	1·12	1·13
November	0·94	0·32	0·83	0·70	0·73
December	2·76	0·55	0·44	1·25	0·89
Total	10·85	9·30	11·93	10·70	11·44

Useful Rainfall.

Seeding Rains (April-May)	1·09	1·09	2·85	1·68	1·72
Winter Rains (June-July)	1·70	1·80	2·48	1·99	2·35
Spring Rains (August-October)	2·44	5·07	3·95	3·82	3·95
Early Summer Rains (November)	0·94	0·32	0·83	0·70	0·73
Total	6·17	8·28	10·11	8·19	8·75

The average rainfall for the district is 11.44in., of which 8.75 falls during the growing period of the crop. For the past three years both the total and useful falls have averaged slightly below the mean with 10.70in. and 8.19in. respectively.

Whilst the total fall for 1930 was relatively light, the rains were well distributed, and despite a comparatively dry September the crops yielded better than was the case in 1931, when although more rain was recorded throughout the year the dry period experienced in October appreciably reduced the wheat yields. However in that year seeding rains were early and bountiful, with the result that self-sown crops were particularly good. Over the three years during which these experiments have been in progress the seasonal conditions have been relatively favorable.

Manurial Experiments, Copeville.

	No Super.	½cwt. 45 Grade Super. (11½lbs. P_2O_5).	1cwt. 45 Grade Super. (23lbs. P_2O_5).	1½cwts. 45 Grade Super. (34½lbs. P_2O_5).	2cwts. 45 Grade Super. (46lbs. P_2O_5).	3cwts. 45 Grade Super. (69lbs. P_2O_5).
	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
1929	1 0	4 53	8 7	7 43	8 3	8 39
1930	13 54	20 4	21 37	21 51	22 36	24 17
1931	6 20	10 59	15 27	17 40	17 33	20 37
Means	7 5	11 59	15 4	15 45	16 4	17 51
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Value at 3s. 4d. per bushel	1 3 7	1 19 11	2 10 3	2 12 6	2 13 7	2 19 6
Net value with Super. at 5s. per cwt.	1 3 7	1 17 5	2 5 3	2 5 0	2 3 7	2 4 6

In each season the 3cwt. dressing has given the maximum grain yield, and over the three-year period has averaged 17bush. 51lbs. per acre. A very marked increase in yield has followed the first and second ½cwt. applications of superphosphate, and in this connection a dressing of 1cwt. 45 grade superphosphate has more than doubled the return of that from the no-manure plot, the actual figures being 7bush. 5lbs. and 15bush. 4lbs. per acre. Succeeding manurings have not had the same effect, and the increase between the 1cwt. and 2cwt. dressings is only 1bush, or 15bush. 4lbs. comparatively with 16bush. 4lbs. When these returns are reduced to net cash values by allowing 3s. 4d. per bushel for the wheat and 5s. per cwt. for the superphosphate, the most profitable crop is that harvested from the 1cwt. of superphosphate plot. This manuring has resulted in a net return of £2 5s. 3d. per acre or 3d. more than the 1½cwt. application. However, there is practically no difference in the value of the wheat crop secured from the phosphatic dressings ranging from 1cwt. to 3cwts. per acre, and therefore it can be concluded that superphosphate should be applied with the wheat crop at the rate of at least 1cwt. per acre, and preferably at heavier dressings if the residual effect on the grazing which follows is taken into consideration.

Wheat Varieties, Copeville.

	1929.		1930.		1931.		Means, 1929-31.	
	B.	L.	B.	L.	B.	L.	B.	L.
Canberra	10	27	21	3	22	45	18	5
Faun	8	59	23	16	21	25	17	53
Regent	9	54	23	17	18	15	17	9
Gluyas	10	40	21	51	17	40	16	44
Gallipoli	10	29	17	43	20	18	16	10
Felix	8	18	21	59	17	29	15	55
Gloss	9	13	20	39	16	59	15	37
Sultan	7	46	18	54	18	24	15	1
Sword	—		—		17	56	—	

In individual years Gluyas, Regent, and Canberra have headed the returns in the variety tests, whilst over the three-year period the latter has given the best average return with 18bush. 5lbs. per acre, closely followed by Faun with 17bush. 53lbs. per acre. Regent occupies third position with 17bush. 9lbs., whilst both Gluyas and Gallipoli have exceeded the 16bush. mark. Canberra is an early ripening Federation crossbred raised in New South Wales which has exhibited marked drought-resistant qualities. Faun was bred at Roseworthy College by mating Late Gluyas with Anvil, and has yielded well in certain parts of the Murray Mallee. Regent is also a Roseworthy crossbred, claiming Regal and Gluyas as parents, and resembles the latter in many respects. On the results obtained these three wheats can be recommended for this district.

RATE OF SEEDING EXPERIMENTS, COPEVILLE.

Experiments relating to the optimum rate of seeding for wheat sown on fallow ground were commenced in 1929. However, rabbits destroyed portion of the crop in 1931, and therefore we have only the results from two seasons to publish.

Seed per Acre.	1929.		1930.		Means.	
	B.	L.	B.	L.	B.	L.
30lbs.	7	14	18	52	13	3
45lbs.	7	46	18	54	13	20
60lbs.	7	43	17	35	12	39

Sultan wheat was seeded in each year together with 1½cwts. of superphosphate per acre. No conclusions can be drawn from two seasons' work, but it would appear that there is no advantage in utilising more than 45lbs. of wheat per acre on fallow ground in this district.

PASTURE EXPERIMENTS AT COPEVILLE.

This season a pasture variety trial was commenced in which seven varieties were seeded as pure stands in blocks each approximately one acre in area. The fodders planted consist of Wimmera Rye Grass, Perennial Rye Grass, *Phalaris tuberosa,* Lucerne, Clustered Clover, *Danthonia pilosa,* and Creeping Saltbush. These were seeded toward the middle of May on fallow ground, and manured with 1½cwts. of 45 grade superphosphate per acre. With the exception of the Clustered Clover and *Danthonia pilosa* a satisfactory germination resulted. Particularly strong growth has been made by Wimmera Rye Grass and *Phalaris tuberosa,* and it will be interesting to see whether the latter variety will be able to persist under these climatic conditions.

(To be continued.)

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR OCTOBER.

[By CHAS. H. BEAUMONT, District Horticultural Instructor.]

This month, as the last, is one of the most critical periods in the control of pests, whether insect or fungus. To prevent the pests getting a start is the special endeavor of every orchardist; we know that the eradication is impossible; control is possible, though the weather has, of course, a lot to do with the effectiveness; but if we know what we have to control, and apply known good remedies at the proper time, we are doing all that we are able. The best of material applied too late is waste of time and money. For insect pests use arsenate of lead, and for fungus pests use lime-sulphur; a little atomic sulphur may be of advantage if added to the lime-sulphur when the weather is favorable to the spread of fungus diseases.

Use fine sulphur, with about 10 per cent. of air-slaked lime added, for dusting vines. This will control oidium; a bordeaux dust must be used (or the wet) if there is any sign of downy mildew.

For aphis use the black leaf 40, either wet or dry, as soon as the first insects are noticed; green aphis is about on peaches and cherries, and on some plums.

If mildew is noticed on strawberries, use sulphur with a little lime as above, but do not put on thickly; a light dressing is all that is required.

For codlin moth we still have to rely on arsenate of lead; the main thing is to have it on before all the petals have dropped; spray under as well as over, and then keep a coat all the time on the young fruit.

Borers may soon be seen on the foliage, and should be picked off.

Do not let young trees, especially citrus and vines, suffer from want of water, and keep the soil about them free from weeds.

Glass-house tomatoes will need close attention; remove sick plants and burn them; keep soil moist; open houses on very hot days, but closed at night.

Cincturing of Zante currants is done when the caps start to fall, but care is necessary in the operation. A very narrow cut is all that is required, and it should be through the bark, but no further.

Picking equipment should be in good order and clean.

STATE OF SOUTH AUSTRALIA.

ORCHARD, VINEYARD, AND MISCELLANEOUS CROP STATISTICS, 1931-32.

(Valuations of products are subject to revision.)

[By W. L. JOHNSTON, F.S.S., Government Statist.]

I. ORCHARDS.

Estimated Value of Total Products, £720,000 (£577,531).

1. *Acreage.*—29,077 (29,630) acres, decrease 553 acres; trees of bearing age, 25,835 (26,095) acres. Approximately 430 acres grubbed, mostly in Central Division, portion being replaced by vines. About 150 acres died out. Very little new planting.

2. *Production.*—Generally speaking, the chief crops were an improvement on the previous year, the most notable being—(*a*) *Apples*, 876,328bush. (486,773bush.), an increase of 389,555bush., but 475,936bush. below the record yield of 1,352,264bush. in 1927-28. (*b*) *Oranges*, 574,700bush. (409,816bush.), increase 164,884bush. established a record, the previous best being 411,508bush. in 1922-23. (*c*) *Pears*, 199,331bush. (127,883bush.), increase 71,448bush. The yield has been surpassed only twice, viz., 213,688bush. and 210,221bush. in 1927-28 and 1929-30 respectively. (*d*) *Other Fruits*—Details are shown in the accompanying table.

II. VINEYARDS.

Estimated Value of Total Products, £2,210,000 (£1,969,836).

1. *Acreage.*—52,498 (52,244) acres, increase 254 acres; vines of bearing age, 50,886 (49,521) acres. About 320 acres grubbed or died out, but more than counterbalanced by new plantings—about 580 acres—chiefly in counties Adelaide and Light, and to a lesser extent in counties Albert, Alfred, and Hamley.

The acreage was described as follows:—For winemaking 33,572 (33,053) acres, drying 18,379 (18,552) acres, and table 547 (629) acres.

2. *Total Grape Yield.*—118,401 (109,566) tons, increase 8,835 tons, average per acre of bearing age 2.32 (2.21) tons. For winemaking 59,202 (56,159) tons, drying 58,529 (52,516) tons, and table 670 (891) tons.

3. *Wine Made.*—10,680,000galls. (10,131,034galls.), increase 548,966galls., but well below the average of the previous five seasons, 13,269,269galls.

III. DRIED FRUITS.

Estimated Value (included in Orchard and Vineyard Sections), £810,000 (£669,721).

1. *Currants.*—156,393cwts. (151,761cwts.), increase 4,632. The quantity has been exceeded only twice, viz., 164,145cwts. in 1928-29 and 161,880cwts. in 1929-30.

2. *Raisins.*—Sultanas 159,591cwts. (111,599cwts.), increase 47,922cwts.—this is well above the previous five years' mean, 132,377cwts., but far short of the record, 188,503cwts. in 1929-30. Other raisins 25,096cwts. (44,903cwts.), decrease 19,807cwts.

3. *Other Dried Fruits.*—Apricots 12,881cwts. (14,956cwts.), decrease 2,075cwts., formed the main item. Other details are shown in table herewith.

IV. MISCELLANEOUS.

Estimated Value of Products, £410,000 (£325,659).

Market Gardens, 1,726 (1,663) acres. *Pumpkins and Melons*, 338 (379) acres, 1,941 (2,128) tons. *Tomatoes*, 603 (640) acres, 180,412bush. (169,825bush.); crop only once exceeded, viz., 232,622bush. in 1923-24. *Potatoes*, 5,996 (4,998) acres, 24,062 (18,991) tons; heaviest yield since 1913-14. *Onions*, 405 (407) acres, 2,994 (3,181) tons. *Other Root Crops*, 602 (684) acres, 3,623 (4,008) tons. *Nurseries*, 150 (148) acres.

V. OVERSEA EXPORTS.

The value of the total oversea exports of the products of vineyards and orchards for the year 1931-32 was estimated at £1,558,888 (£1,056,557), increase £502,331, the principal items being dried fruits £575,180 (£619,570), wine £800,587 (£418,240), apples £162,455 (£13,911). Interstate exports are not available.

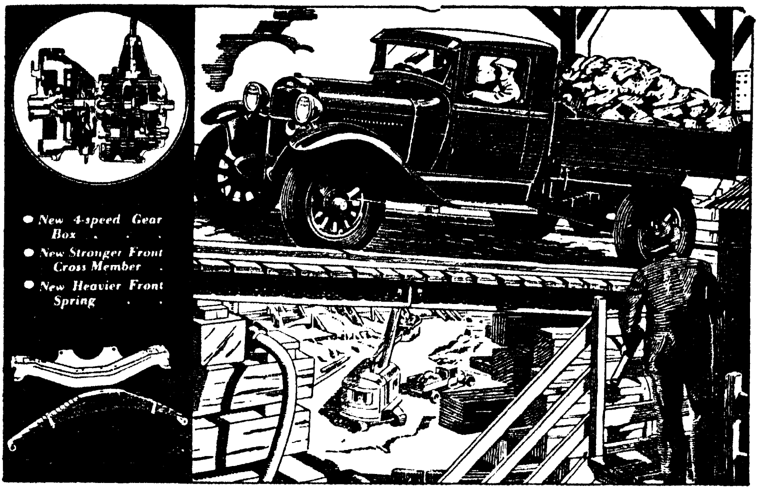
AREA AND PRODUCTION OF ORCHARDS, VINEYARDS, ETC., SEASON 1931-32.

Crop.	Unit of Quantity.	Season 1931-32.	Season 1930-31.	Mean of Five Seasons to 1930-31.
		AREA.		
Orchards	Acre	29,077	29,630	30,618
Vineyards	"	52,498	52,234	51,460
Minor Crops—				
Potatoes	"	5,996	4,998	4,382
Onions	"	405	407	420
Total Root Crops	"	7,003	6,089	5,394
Market Gardens, &c.	"	2,667	2,682	2,375
Tomatoes	"	603	640	572
Nurseries	"	150	148	140
		PRODUCTION.		
Orchards—				
Almonds	cwt.	5,787	6,955	5,981
Walnuts	"	925	795	549
Olives—Berries	"	(1931) 5,992	(1930) 10,925	8,844
Olive Oil	gall.	(1931) 10,857	(1930) 18,488	16,644
Apples	bush.	876,328	486,773	774,434
Apricots	"	250,013	283,570	266,793
Cherries	"	38,135	35,962	35,115
Figs	"	17,730	14,249	15,982
Nectarines	"	16,981	23,973	25,458
Peaches	"	101,959	114,166	147,956
Pears	"	199,331	127,883	169,319
Plums and Prunes	"	142,308	134,924	145,027
Quinces	"	22,328	24,777	25,223
Oranges	"	(1931) 574,700	(1930) 409,816	386,907
Lemons	"	(1931) 40,258	(1930) 28,185	37,068
Other Citrus	"	(1931) 4,205	(1930) 3,839	3,685
Raspberries	cwt.	1,099	2,294	2,004
Strawberries	"	1,371	2,290	1,830
Other Bush and Berry Fruit	"	1,557	1,443	1,996
Other Fruits	bush.	760	3,225	3,139
Dried Fruits—				
Apples	cwt.	714	124	508
Apricots	"	12,881	14,956	12,571
Figs	"	314	288	167
Nectarines	"	265	677	854
Peaches	"	2,893	3,833	4,155
Pears	"	3,862	2,419	2,514
Plums	"	606	992	1,158
Prunes	"	4,312	4,291	3,975
Vineyards—				
Total Grape Yield	ton	118,401	109,566	120,337
Wine made	gall.	10,680,000	10,131,034	13,269,269
Currants	cwt.	156,393	151,761	123,174
Raisins—Sultana	"	159,591	111,599	132,377
Other	"	25,096	44,903	26,784
Minor Crops—				
Potatoes	ton	24,062	18,991	16,193
Onions	"	2,994	3,181	3,214
Tomatoes	bush.	180,412	169,825	154,701

ARTIFICIAL MANURES USED—141,653 (182,906) TONS FOR CROPS, 7,054 (11,102) TONS FOR TOP-DRESSING.

Division.	AREA CROPPED.						MANURE USED.					
	Total.			% Manured.			Total.			Average per Acre.		
	1929-30.	1930-31.	1931-32.	1929-30.	1930-31.	1931-32.	1929-30.	1930-31.	1931-32.	1929-30.	1930-31.	1931-32.
	Acres.	Acres.	Acres.	%	%	%	Tons.	Tons.	Tons.	Lbs.	Lbs.	Lbs.
Central	1,045,127	1,089,506	1,075,256	91·24	90·44	86·26	49,999	49,664	42,407	117·5	112·9	102·4
Lower North	1,030,633	1,046,221	1,068,638	96·29	96·23	93·04	40,416	39,625	33,449	91·2	88·2	75·4
Upper North	287,343	362,517	463,135	79·51	63·64	47·44	8,004	7,559	5,227	78·5	73·4	53·3
South-Eastern	129,935	142,936	131,331	85·19	87·38	83·08	5,920	6,622	4,912	119·8	118·8	100·8
Western	1,235,587	1,404,567	1,309,622	94·10	91·59	71·33	36,513	38,793	24,241	70·3	67·6	58·1
Murray Valley	1,238,291	1,380,327	1,173,208	93·06	93·20	87·69	40,193	40,643	31,417	78·1	70·8	68·4
Total State ...	4,966,916	5,426,074	5,221,190	92·62	90·69	80·70	181,045	182,906	141,653	88·2	83·3	75·3
Increase or Dec. (−)	306,914	459,158	−204,884	1·39	−1·93	−9·99	9,080	1,861	−41,253	−2·4	−4·9	−8·0

Manures.—In addition to 141,653 (182,906) tons manure used for crops as above, 7,054 (11,102) tons were used for top-dressing—the acreage top-dressed being County Adelaide, 22,409 (35,338); Hindmarsh, 22,984 (38,223); Light, 954 (4,711); Sturt, 9,504 (10,892); Buckingham, 4,340 (1,721); Grey, 26,476 (39,932); MacDonnell, 13,114 (17,550); Robe, 27,391 (31,446); others, 12,156 (24,726); Total 139,328 (214,539).



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STATISTICS OF THE DAIRYING INDUSTRY.

1. Strength of Herds.—After a fall from 127,292 dairy cattle in January, 1927, to 104,255 in 1930, January, 1932, records a recovery to 127,756—464 greater than January, 1927—with a potential further increase from the 14,896 other heifers over one year old.

Year (Jan. 1).	Total.	In Milk.	Dry.	Heifers, Springing.	Other Heifers, 1yr. & over.
1927	127,292	86,172	32,289	8,831	12,719
1930...............	104,255	75,574	21,219	7,462	11,726
1931	109,672	79,805	20,406	9,461	13,591
1932	127,756	90,767	23,171	13,818	14,896

The Dairy Cattle were distributed as follows:—*Central Division*, 62,995 (County Adelaide 22,701, Hindmarsh 9,905, Light 7,920, Sturt 8,443); *Lower North*, 17,526 (County Stanley 5,834, Victoria 5,460); *Upper North*, 8,175 (County Dalhousie 3,065, Frome 3,338); *South-Eastern*, 17,230 (County Grey 13,007); *Western*, 6,976; *Murray Mallee*, 14,854 (County Russell 5,397).

2. Classification of Dairy Herds.—For the year 1932 there were 19,759 farmers recording dairy herds; 1931, 19,315; 1930, 18,866. The cows have been classified in the following groups:—

Year (Jan. 1).	Number of Herds in each Group.						
	1-4.	5-9.	10-14.	15-19.	20-29.	30-49.	50 & over.
1930	12,138	4,596	1,079	434	392	193	34
1931	12,026	4,939	1,230	439	451	203	27
1932	10,640	5,911	1,763	614	531	257	43
Divisions—							
Central	4,121	2,720	884	327	293	155	30
L. North	1,848	1,095	232	46	30	7	1
U. North............	742	458	124	31	24	11	—
S. Eastern	734	614	329	159	105	33	5
Western	1,522	359	40	10	2	1	1
M. Mallee	1,673	665	154	41	77	50	6

Comparing the last two years, the number of herds in the group 1 to 4 decreased to 10,640 (12,026), whereas all the other groups with large herds increased.

3. Production.—*Butter*—After six low years ranging from 10 to 13 million lbs. the production of butter for the year 1931-32 increased to 17,559,166lbs., exceeding the previous record of 17,244,389lbs. in 1924 by 314,777lbs. *Cheese* production also increased from the record of 1930-31 (3,901,159lbs.) to 5,109,933lbs. *Pigs slaughtered* 114,313 compared with 111,307 in 1930-31.

	1929-30.	1930-31.	1931-32.
Butter (lbs.)	10,789,706	12,961,213	17,559,166
Cheese (lbs.)	3,536,934	3,901,159	5,109,933
Pigs slaughtered (No.) .	94,950	111,307	114,313

4. Oversea Exports.—Record quantities of Butter and Cheese were exported to overseas countries:—*Butter*, 7,400,628lbs. (£370,560) compared with 2,456,894lbs. (£119,604) in 1930-31, and 659,061lbs. (£50,922) in 1929-30, *Cheese*, 898,847lbs. (£29,686). No cheese had been exported during the previous five years.

5. Factories.—The development of the dairying industries is reflected in the factories for Butter, Cheese, Bacon, and Ham. For the latest year of complete record (1930-31) there were 47 factories employing 739 hands with a wage bill of £93,477, an output value of £1,103,319, and with capital invested in factory land, buildings, plant and machinery to the value of £355,715.

RETURN OF EGGS AND EGG PULP EXPORTED FROM SOUTH AUSTRALIA TO EACH OF THE STATES AND TO OVERSEA COUNTRIES FOR YEAR ENDED JUNE 30th, 1932.

(Compiled by the Government Statist from returns specially collected from Exporting Merchants.)

State.	Eggs in Shell.		Egg Pulp.		Total Value.
	Doz.	£	lbs.	£	£
New South Wales (ex. B.H.) ..	640,076	28,934	708,183	24,023	52,957
Broken Hill	200,705	9,642	17,698	479	10,121
Victoria	278,182	13,135	408,731	15,784	28,919
Other States	78,259	4,921	29,985	933	5,854
Total Interstate 1931-2	1,197,222	56,632	1,164,597	41,219	97,851
1930-1	1,267,112	71,038	1,044,888	39,577	110,615
Oversea (Direct) 1931-2	2,026,220	88,017	1,329,000	47,039	135,056
1930-1	772,680	41,301	124,000	4,716	46,017
GRAND TOTAL 1931-2 ...	3,223,442	144,649	2,493,597	88,258	232,907
1930-1 ...	2,039,792	112,339	1,168,888	44,293	156,632

NOTE.—The grand total twelve months Exports of Eggs in shell and in pulp in terms of eggs in shell is estimated to be 5,200,000 (3,000,000) dozen.

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SUMMARY OF PLANT DISEASE RECORDS IN SOUTH AUSTRALIA FOR THE TWO YEARS ENDING JUNE 30TH, 1932.

[By GEOFFREY SAMUEL, M.Sc., Waite Agricultural Research Institute, University of Adelaide.]

Rainfall.—The rainfall, which is the main factor influencing the development of plant diseases, may be briefly indicated for the years under review as follows:—

1930. A very late break to the season, with rainfall for the first six months much below the average; from July to October rainfall considerably above the average, so that the year closed with a total of 18.6in. at Adelaide (average 21.1in.).

1931. An earlier break and a cloudy, wet winter, followed by a dry spring. Total rainfall 22.3in. at Adelaide (average 21.1in.).

1932. An early break to the season, with rainfall considerably above the average for the first six months (14.54in., average 10.00in.), due mainly to an excess in April.

Cereals.—There was again comparatively little loss from take-all either year, except that in the Murray Mallee district in 1930 there was an appreciable amount of "whiteheads." This was probably due to late root infection with *Ophiobolus graminis* and *Helminthosporium sativum*, though in many cases not sufficient to cause blackening of the stem-bases. Red Rust or Stem Rust (*Puccinia graminis*) was moderate to severe in some areas in 1930—completely destroying some crops in the Loxton district—and light to moderate in 1931. Flag Smut (*Urocystis tritici*) was slightly more in evidence in infected districts in both years. *Rhizoctonia solani* and Nematodes or Eel-worms (*Heterodera schachtii*) occur in small patches in wheat and oat crops every year, mainly in the mallee areas. Cereal smuts were light in both years.

Pastures.—The Red Grass-destroying fungus *Isaria graminiperda* was reported from a number of localities both in the north and in the south-east in 1931. It attacked mainly *Poa bulbosa* in patches of limited extent. This is the first record of the fungus for this State. The introduced grass *Brachypodium distachyum*, which is spreading in the neighborhood of Adelaide, is very severely affected with smut (*Ustilago bromivora?*) almost every year.

Vines.—Further cases of what is considered to be salt injury to vines following the run of dry seasons were recorded. Frost in October, 1931, caused serious damage to vines in the Clare and Coonawarra districts. A case of court-noué was recorded from Waikerie in 1931, and a case of variegation of the leaves from Clare. With the early break of the season in 1932 considerable trouble was caused by the mould *Botrytis cinerea* in the currant drying areas. A little Anthracnose (*Gloeosporium ampelophagum*) was noted in 1930-31, but on the whole vines have been very free from disease.

Citrus.—The wet winter of 1931 was responsible for Brown Rot (*Phytophthora hibernalis*) causing considerable losses of citrus fruit in the non-irrigated areas, particularly the Inman Valley. Bacterial Spot (*Bacterium citriputeale*) was also more prevalent than usual. A stem-end rot of the fruit caused by a species of *Phomopsis* agreeing closely with *Phomopsis californica* was recorded in one case from Coromandel Valley. In another case a *Pleospora*, agreeing closely with *Pleospora herbarum*, caused a definite slow rot of a black leathery nature with reddish discoloration at the margins. Both these are new records for the State. A case of *Armillaria mellea* appeared on oranges at Kingston following the digging in of chips from the wood-heap. A few cases of Crinkle (cracking of the pithy part of the rind beneath the surface) were recorded from the drier areas.

Stone and Pome Fruits.—Silver leaf (*Stereum purpureum*) is gradually increasing in amount in the Adelaide hills, having been recorded on plums, apricots, and apples, and was also noted on Kangaroo Island. Black Spot or Scab of Apple (*Venturia inaequalis*) was more prevalent in 1931-32 than for some years past, but was not serious. Apple bark rot (*Physalospora cydoniae*) was reported from several localities. Curl-leaf of peaches (*Taphrina deformans*) was bad in the wetter districts in 1931, and Shot-hole or Scab of apricots (*Clasterosporium carpophilum*) was also more prevalent than usual.

Vegetables.—Irish Blight of potatoes (*Phytophthora infestans*) was more prevalent in 1931 than for a number of years, and was severe again in the early part of 1932, many tons of potatoes being lost in the Mount Gambier district. Bacterial Blight of French beans, agreeing in symptoms with *Phytomonas medicaginis*, var. *phaseolicola*, was also the cause of considerable loss of beans in both seasons. Celery blight (*Septoria apii*) was severe again, but control by spraying with Bordeaux Mixture is being more widely adopted. *Armillaria mellea* severely damaged one bed of parsnips and carrots at Kingston. Neck Rot of onions in storage (*Botrytis allii*) and Onion Smudge (*Colletotrichum circinans*) were both recorded for the first time, as also was a *Fusarium* wilt of watermelons.

Tomatoes.—Spotted wilt (virus) was generally distributed in both years, being more severe in 1930-31 than in 1931-32. A severe case of non-setting of the fruit due to Mosaic was recorded for a glasshouse. *Macrosporium solani* is becoming more prevalent in glasshouses, and *Fusarium lycopersici* was noted in a few houses. The mite *Phyllocoptes lycopersici* was noted on many occasions, both in glasshouses and outdoors, as also was the root-knot nematode (*Heterodera radicicola*).

Tobacco.—Downy Mildew or Blue Mould of tobacco (*Peronospora hyoscyami*) was more prevalent in tobacco seedbeds in 1931, and in the autumn of 1932 was found on some field crops. Tomato spotted wilt (virus) usually occurs only on odd plants, but in a small field at Mount Gambier in 1932 more than 30 per cent. of the plants were lost from this disease.

Ornamental Plants.—Irish blight (*Phytophthora infestans*) was recorded for the first time on seedling petunias in frames in 1931. *Rhizoctonia solani* caused a collar rot of sweet peas in a glasshouse at Marion, which was checked by the application of Cheshunt Mixture. Carnation rust (*Uromyces caryophyllinus*) was recorded for the first time. Hollyhock rust (*Puccinia malvacearum*), marigold rust (*Puccinia calendulae*), and sunflower rust (*Puccinia helianthi*) all occurred more than usual.

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RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1—WHITE LEGHORNS.

Competitors.	Address.	Score to Month ending September 30th, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals.
Austwick, S.	West Marden	(1) 90	(2) 107	(3) 78	275
Barker, C. R.	Edwardstown	(4) 69	(5) 87	(6) *	156
Bolland, H.	Knoxville	(7) *	(8) 94	(9) 58	152
Butson, A.	Clarence Park	(10) 95	(11) 69	(12) 105	269
Carmichael, A. B.	Woodville West	(13) 77	(14) *	(15) *	77
Carroll & Leedham	Forest Gardens	(16) 63	(17) 86	(18) 89	238
Carter, W. A.	Glandore	(19) 77	(20) 104	(21) 58	239
Cleland, W. L.	Beaumont	(22) 72	(23) 85	(24) †	157
Cooke, B.	Kanmantoo	(25) 44	(26) 82	(27) 121	247
Cooper, Syd.	Edwardstown	(28) 80	(29) 74	(30) 68	222
Crawford, L. H.	Grange	(31) 119	(32) 40	(33) 75	234
Crittenden, R. C.	Kilkenny North	(34) 90	(35) 125	(36) 119	334
Dawes, A. G.	Glenunga Gardens	(37) 116	(38) 78	(39) 100	294
Dawes, A. G.	Glenunga Gardens	(40) 73	(41) ‡	(42) ‡	73
Dawes, A. G.	Glenunga Gardens	(43) 117	(44) 78	(45) *	195
Dawes, A. G.	Glenunga Gardens	(46) 102	(47) 82	(48) 77	261
Dawes, A. G.	Glenunga Gardens	(49) 56	(50) 73	(51) 111	240
Dawes, A. G.	Glenunga Gardens	(52) 69	(53) 132	(54) 81	282
Dawes, A. G.	Glenunga Gardens	(55) 96	(56) 82	(57) 92	270
Duhring, T.	Mallala	(58) 74	(59) 73	(60) 91	238
Easther, Colin J.	Black Forest	(61) 104	(62) 75	(63) 114	293
Edgcumbe, J. L.	Plenty, Victoria	(64) 103	(65) 107	(66) *	210
Fidge, H.	Clarence Park	(67) 54	(68) 95	(69) *	149
Fox, Russell H.	Edwardstown	(70) 52	(71) 38	(72) 101	191
Gilbert, L. H.	Glanville Blocks	(73) 45	(74) *	(75) 87	132
Goldsmith, Keith	Kensington	(76) 106	(77) *	(78) *	106
Gore, A. G.	Summertown	(79) 123	(80) *	(81) 103	226
Gurr, A. & H.	Scott's Creek	(82) 52	(83) 108	(84) *	160
Hefford, H. H.	Murray Bridge	(85) *	(86) *	(87) 82	82
Hefford, H. H.	Murray Bridge	(88) 111	(89) 71	(90) *	182
Hillyer, Jas.	Kilkenny	(91) 82	(92) 106	(93) 105	293
Hodgson, W. H. A.	Salisbury	(94) 52	(95) 46	(96) 59	157
Lamerton, E. A.	Edwardstown	(97) 89	(98) 86	(99) *	175
Lindquist, E. F.	Semaphore Park	(100) *	(101) 105	(102) 118	223
Lindsay, Mrs. P. G.	Croydon	(103) 69	(104) 63	(105) ‡	132
Morris, H.	Seaton Park	(106) 83	(107) ‡	(108) 56	139
McPherson, K. R.	Blackwood	(109) ‡	(110) ‡	(111) 26	26
Nicholls, H. R.	Eden Hills	(112) *	(113) *	(114) ‡	—
Oliver, J. H.	Goodwood Park	(115) 74	(116) *	(117) *	74
Radbone, T. B.	Colonel Light Gdns.	(118) 76	(119) 77	(120) 95	248
Rassmussen, H. A.	Ethelton	(121) 91	(122) 69	(123) *	160
Woodbury Poultry Farm	Crafers	(124) *	(125) 39	(126) 81	120
Woodbury Poultry Farm	Crafers	(127) 82	(128) 103	(129) 112	297
Rowe, Bruce	Two Wells	(130) 113	(131) *	(132) 88	201

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitors.	Address.	Score to Month ending September 30th, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 63	(134) ‡	(135) 108	171
Slape, W. C.	Magill	(136) 119	(137) 66	(138) 113	298
Thomas & Elson	Hawthorn	(139) 88	(140) 69	(141) 81	238
Thomas & Elson	Hawthorn	(142) 88	(143) 95	(144) 107	290
Vowels, C. C.	Westbourne Park	(145) 91	(146) 101	(147) *	192
Welford, F. F.	Colonel Light Gdns.	(148) 50	(149) 64	(150) 91	205
Urlwin, A. P.	Balaklava	(151) 62	(152) 77	(153) 77	216
Wiese, W.	Cabra	(154) *	(155) 53	(156) *	53
Wiese, W.	Cabra	(157) *	(158) *	(159) *	—
Williams, F. J.	Millswood Estate	(160) *	(161) 81	(162) *	81
Williams, W. R.	Frewville	(163) 76	(164) 103	(165) †	179
Williams, W. R.	Frewville	(166) 121	(167) 67	(168) 93	281
Woodley, W.	Tailem Bend	(169) 69	(170) 77	(171) 82	228
Connor, D. C.	Gawler	(172) ‡	(173) 98	(174) 92	190
Tolhurst, A. E.	Torrens Park	(175) 54	(176) *	(177) 85	139
Gurr, A. & H.	Scott's Creek	(202) *	(203) *	(204) 102	102
Totals		4,021	3,690	3,581	11,292

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

Gameau, V. F.	Woodville	(178) 44	(179) 73	(180) 64	181
Totals		44	73	64	181

Anconas.

Williams, W. R.	Frewville	(181) 48	(182) 52	(183) *	100
Totals		48	52	*	100

SECTION 3—BLACK ORPINGTONS.

Richardson, N. F.	Woodville	(184) 89	(185) 122	(186) 118	329
Cook, Arthur	Colonel Light Gdns.	(187) 115	(188) *	(189) ‡	115
Cooke, B.	Kanmantoo	(190) *	(191) *	(192) 90	90
Crago, Jack	Prospect	(193) 70	(194) 71	(195) ‡	141
Crawford, L. H.	Grange	(196) 120	(197) 73	(198) 71	264
Dowling, J. H.	Glossop	(199) *	(200) *	(201) *	—
Hudson, F. J.	Prospect	(205) 132	(206) 88	(207) *	220
Mills, H. J.	Edwardstown	(208) 65	(209) 104	(210) 133	302
Mills, H. J.	Edwardstown	(211) 78	(212) 138	(213) *	216
Rawe, J.	Seaton Park	(214) 120	(215) *	(216) *	120
Schubert, B. O.	Tanunda	(217) 35	(218) *	(219) 60	95
Frisby Smith, G.	Fulham	(220) 64	(221) 85	(222) 114	263
Twartz, H. L.	Gawler	(223) 114	(224) 87	(225) 109	310
Williams, W. R.	Frewville	(226) 133	(227) ‡	(228) 47	180
Williams, W. R.	Frewville	(229) 73	(230) 114	(231) *	187
Woodley, W.	Tailem Bend	(232) *	(233) 122	(234) 125	247
Totals		1,208	1,004	867	3,079

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Fidge, H.	Clarence Park	(235) 87	(236) 72	(237) 51	210
Gameau, V. F.	Woodville	(238) 115	(239) 66	(240) ‡	181
Williams, W. R.	Frewville	(241) 102	(242) 68	(243) 87	257
Totals		304	206	138	648

*** Denotes disqualified under Rule 13. ‡ Denotes did not lay during July. † Dead.**

A FEW IMPRESSIONS OF FUTURE TRADE PROSPECTS IN THE EAST FOR OUR FRUIT AND VEGETABLES.

[By Max J. Vickers, Lenswood and Forest Range.]

(*Paper read at the 43rd Annual Congress of the Agricultural Bureau, September,* 1932.)

I have been asked to give my impressions of trade prospects in the East, gained by two recent visits—one 12 months ago visiting the Philippines, China, and Japan, and the other to Java and Malaya, from which I returned one month ago. I will deal with the latter countries first.

Volume.

It is pleasing to be able to tell you our trade is increasing in most lines of produce, both in quantity exported from here and in percentage of imports into these countries. The stage was set for a great expansion but for the depression, which I am firmly convinced is even greater in Java and Malaya than in this country. Their main export crops—sugar, rubber, tin, &c.—are as a drug on the markets of the world. Java being one of the very few countries still on the gold standard, is finding it extremely difficult to sell anything. The Australian £ was worth only 10s. 10d. to 11s. 6d. there. This position, of course, would help us, as exporters, immensely, had not the people's purchasing power diminished to such an extent as to offset the value of the very favorable exchange rate.

I do not wish to give the impression that these countries are going to be able to absorb millions of bushels of apples, oranges, &c., like we are putting into the markets of the United Kingdom and Europe. The quantities taken as yet are relatively small, but this, I think, is going to increase yearly. There are 800,000,000 people living from India around to Japan. If only a small proportion eat some fruit we will feel the good effects of it. Witness the remarkable increase in wheat and flour exports to those countries because a small percentage of the population developed a taste for biscuits. It is becoming a greater problem each year to grow enough rice in some of these countries to feed their rapidly increasing numbers. America is exporting rice across the Pacific from California. The population of Java alone is now given at 41,000,000 on an area about twice as large as Tasmania.

Our exports of apples, oranges, &c., to this country comprise about 50 per cent. of its imports, America having most of the remaining trade, with a little coming from Japan and Manchuria. This must be considered fairly satisfactory, for it must not be assumed that it is within the power of Australia to capture the whole of such trade. The incidence of the respective producing seasons is a determining factor in this, and is something which must be borne in mind to get the possibilities of Australian trade with the Netherlands East Indies in the proper perspective.

Ports of Entry.

The chief ports of entry are Sourabaya and Batavia, although Semarang, Pekalongon, Tekal, and Cheribon are ports of call with the boat I travelled by practically no fruit is landed, this territory being chiefly supplied from Sourabaya.

Most importers work on both an indent and consignment basis, but prefer the latter if possible. Selling costs are very high. Importers seem to think they are entitled to about 100 per cent. on the landed cost.

Granny Smith is the most popular apple variety, followed possibly by Dunn's. With pears the varieties most favored are Packham's Winter Nelis and Josephines.

Expenses, as near as I could gather, are:—Per box—handling charges 15 cents, handing charge 15 cents, inspection 35 cents, duty 12 per cent. Currency is 100 cents to Guilder; Guilder 1s. 8d. in gold.

British Malaya.

Here we find the total value of imports of fresh fruits at about £300,000, about one-third of which is represented by fruits such as we could expect to compete for in the trade. This business is divided on about a 50-50 basis with U.S.A. In dried and preserved fruits, America has predominated, but with Australian figures during the last three years showing a steady increase. Of fruits in which Australia is interested, apples comprise nearly half of the imports, with grapes second on the list; these coming mainly from Western Australia.

Distributing Centre.

Singapore is the distributing centre for the whole of British Malaya and for the adjoining countries such as Siam and Burma. Considerable quantities are shipped or railed north in Malaya to Penang, Malacca, Ipoh, Kuala Lumpur, where large numbers of whites are engaged in tin dredging, &c.

Fruit Firms.

The Singapore Cold Storage Company (A. B. P. concern) is the largest, doing, I believe, more than half the business. This firm conducted me around for a day. They have admirable cold storage rooms, built specially for fruit, situated on the wharf. In the city they have another plant called the "Straits Ice Company," which is divided into a large number of small chambers holding, perhaps, 200 cases each, which are leased to dealers, enabling each one to have his stocks stored out of sight and knowledge of his competitors. (Temperature of 36 deg. maintained.)

I was given the opportunity to inspect apples from several Australian States, also American, and oranges, grape fruit, &c., from both countries. We checked

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over a number of experimental shipments made by a Western Australian firm. These had arrived on the same boat as myself—the *M.V. Centaur*. Refrigerator cargo was in the better order, but deck cargo satisfactory, particularly where pre-cooling had been practised. In numbers of cases of oranges picked over, refrigerated cargo showed a loss of only 2 per cent.; deck cargo up to 10 per cent.

Some of the apples on the boat were given wretched conditions—were down on a lower deck with 1,500 live sheep herded around them. No canvas shutes were provided for ventilation. The heat and smell crossing the Equator was almost unbearable down there. I heard these arrived in bad condition, which was not to be wondered at. They would naturally lose their own delightful flavor and absorb that of the sheep.

MARKETS.

We spent considerable time going the rounds of the markets and visiting the Chinese merchants. One heard just an endless stream of complaints until in parting I told them I fervently hoped that some day God would send them a case of apples meeting their requirements. Whilst these people are inveterate "growsers," there is no doubt they are often let down badly. I was shown a line of several hundred cases of South Australian Cleopatras which these people claim were supplied for Granny Smith on an f.o.b. sale. These apples were yellow and badly marked by spray russet. Some being quite deformed by it; evidently having been grown by some primitive grower still using bluestone for black spot control. The fact of these apples not being cold stored prior to shipment and being allowed to become yellow, made them quite useless for this market, which must have them a green color. This represented a big loss to the importers.

A strict inspection should be made of all cases of apples marked "G.S." going over the wharf from here. This variety is being exported only in very small quantities from this State, yet I have seen whole loads branded "G.S." leaving for the ship's side. The biggest argument we have ever had with an apple buyer was through not allowing him to brand 200 cases of Stone Pippin as "G.S." in our shed. Consequently the apples left our shed nameless.

In the East I heard of several instances of this practice, which had thrown a spanner into the business cog wheel. Many people in this country need to get to know the Chinese business man better. They might get the rude shock of finding he is quicker on the uptake than they are.

I am pleased to be able to state that all dealers considered South Australian apples—received for the first time for a number of years—the best received from Australia with the exception of Western Australian "Granny Smith." They voiced their intention of getting their supplies from Adelaide next year—this generally before they knew to which State I belonged. However, they said they were finished with us for this year.

They consider we are an early State, as they had beautiful quality from us in March and April, but in July our apples were much too ripe. This gives a remarkable instance of the impressions gained by them by over-ripe fruit on their first season's acquaintance with us.

VEGETABLES.

I saw small stocks of vegetables carried over from the *Nieu Zeeland* shipment, which had been in cold store in Singapore for 25 days; these were still in good condition. They had peeled off the outer leaves of the cabbages, whilst all leaves had yellowed and fallen off the cauliflowers, allowing the heads to become somewhat dirty and discolored, but otherwise in good condition. They favor the heads being wrapped in cellaphane or some lunch wrap type of paper to prevent this—as practised by American exporters.

CELERY.

South Australian celery they claim to be too big, too green, and too coarse. As one dealer put it, "Plenty bamboo in Malaya—no want it from Australia." They ask for more of the outer leaves to be stripped off. I might mention that in that climate it is never cooked, but only eaten as a cold salad, or with cheese.

TRADE COMPETITION AND REFRIGERATOR SPACE.

There seems a very grave danger of the trade to the countries mentioned developing into a competitive one during the Australian season between the various States. If the exporting interests could confer, some form of space allotment or co-operation would be better than indiscriminate competition.

Refrigerator space on the *Centaur* and *Minderoo* from Fremantle up is very inadequate. The K.P.M. boats calling at Port Adelaide and going *via* the East Coast have considerably more. Both the *Nieu Zeeland* and *Nieu Holland* have 56,700 cubic feet divided into numerous compartments. The Burns Philp *Marella* has the small amount of 2,688 cubic feet. Refrigerator freight to Singapore is 110s. per ship's ton of 40 cubic feet. Refrigerator freight to Java is 100s. per ship's ton of 40 cubic feet. These are the main impressions gained during the trip to the Near East. I propose now to deal briefly with a trip to the Far East.

FAR EAST.

Places visited were the Philippines, Hong Kong, China, and Japan. Japan may be ruled out definitely; there is a 100 per cent. luxury tax imposed on fruit entering there. They grow very considerable amounts of apples and oranges and export them to many Eastern countries. Varieties grown are Newtown's, Romes, Winesap's, &c.

Whilst our percentage of trade to Near Eastern countries might be considered fairly satisfactory, there is surely room for a big increase in it to Hong Kong and China. At present—on 1930 statistics—we are shown as only getting from 2 per cent. at Shanghai to 8 per cent. at Hong Kong of the trade in various fruits and vegetables. I see no reason why this should not be increased to 50 per cent.

TRADE COMMISSIONERS.

The matter of Trade Commissioners being appointed for the East is receiving a good deal of prominence of late. To me this seems a necessity, although results will depend entirely on the right man being appointed. The British Government is finding it necessary to have more commercial representation up there. Until last year it had only three officers—one in Shanghai, one in Pekin, and one in Manchuria.

The average production of dairy cows in Great Britain is 574 gallons of milk a year; in Denmark, 571 gallons; Germany, 520; Norway, 445; Australia, 290 gallons.

THIS SHOWS THE URGENT NECESSITY FOR IMPROVING METHODS OF FEEDING IN AUSTRALIA WITHOUT DELAY.

USE

MEGGITTS
LINSEED
MEAL
FOR DAIRY COWS

Canada, with less than a quarter of the trade of the United Kingdom with China, maintains four officials, whilst the United States of America have 14. And the two latter countries seem to have the lion's share of the trading in such lines in which we can compete—wheat, flour, fruit, butter.

Most opposition to these appointments comes, I think, from those firms having definite trade connections with these countries. They have gathered experience and knowledge of trade requirements at the expense of much time and money, and do not agree that this should be made available to their possible competitors at no cost.

STORAGE.

Cold storage facilities are available at both Hong Kong and Shanghai for the carry over of fruit, at a cost of about 5d. per case per month. There is a powerful Fruit Merchants' Guild operating in Shanghai, and practically all imported fruit passes through the hands of this association.

RETAIL STORES.

We visited the largest department stores here to see their displays of fruit—the Wing On, and the Sincere Company—both founded by Chinese who made their money trading in Australia. These are larger than any department stores in Australia. These concerns, as in Japan and America, make a speciality of fruit selling in their basements, and work on finer margins of profit than can small shops selling fruit alone.

Oranges were on sale from Japan and America, and apples from Manchuria and the two first named countries, but none from Australia; celery, lettuce, spinach also from Oregon.

The purchasing power for these has to come mainly from 200,000 wealthy Chinese resident there. The foreign population numbers only about 53,000, of whom half are Japanese and several thousand of the rest consist of white Russian refugees who have not much buying power.

HONG KONG.

We are better situated to compete for the trade in Hong Kong and the Philippines than in Northern China. Empress (C.P.R.) boats make the trip from Vancouver to Shanghai, *via* Japan in 12 days, thus giving their exporters a great advantage over us for that market. Over 40 per cent. of the total oversea trade of China passes through Shanghai. Hong Kong has a fairly large European population; has an army garrison and a naval base; is also a great shipping centre.

PHILIPPINES.

We are the best situated geographically to get the trade of this country. It is the biggest market in the East—over 50 per cent. of all fruit and vegetables leaving California for the East goes to the Philippines. There are thousands of Americans drawing big salaries in gold dollars there, and their habits of eating fresh fruit and fresh vegetable salads in a big way have been taken up by the wealthy Chinese and the better class Filipinos. This group are reasonably close to Australia, whilst it is the last port of call for the C.P.R. and Dollar boats *via* Japan.

To meet American competition in these countries a big effort has to be made and sustained. To-day, through the exchange, we have a price advantage of which we should make full ues. Once we are well established on the market and our brands known, even if the price advantage is lost, we should have secured sufficient goodwill to maintain the trade on quality and efficient merchandising, against the forceful sales methods and adequate representation of American interests.

MAMMITIS, MILK FEVER, AND CONTAGIOUS ABORTION.

[By ALAN H. ROBIN, B.V.Sc., Government Veterinary Officer, Stock and Brands Department.]

(Paper read at the Forty-third Congress of the Agricultural Bureau, September, 1932.)

MAMMITIS.

Mammitis (or Mastitis) is an inflammation of the udder, and is one of the most formidable diseases of dairy cattle. The monetary loss annually sustained by the dairying industry in this State through the ravages of this disease must total to a very large sum indeed.

CAUSE.

All cases of Mammitis are caused by germs which have gained an entry into the interior of the udder, though the class of organism responsible may vary in different cases. The species of germ responsible for the majority of cases is known scientifically as a *Streptococcus*, but almost any of the numerous different kinds of filth germs which abound in dirt and dust and which have plenty of opportunities of getting on to the hair and skin of a cow's udder and hindquarters, through soilage of those parts, are able, under suitable conditions, to set up the disease.

There are two routes by which infection of the interior of the udder may take place, namely, (1) by way of the teat canal, and (2) through abrasions or sores on the skin of the udder and teats. Of the two, the former is the more common.

Invasion of the teat canal to some extent with germs is an event that is more or less continually taking place, as microscopical examination of the first squirt or two of milk from a quarter of any healthy cow will show. But, like any other animal, the cow is endowed with a certain degree of natural resistance to disease, and so long as she continues in good health and her udder is kept in sound order, these "invading" germs are got rid of out of the "bag" at milking time without having occasioned any harm. The udder is, however, a delicate organ, and, especially when in full milk, is very sensitive to any deleterious influences to which it may be subjected, and should any such be allowed to operate—as they often are in practice—then the germs are enabled to "go ahead" and set up the disease. Such injurious influences may be termed the "contributory causes of Mammitis," and the commonest are:—Severe chilling of the udder through exposure to cold and wet conditions, bruising and wounding of the udder by kicks, &c., rough milking (either by hand or running machines at too high a pressure), "over-stocking," and leaving the teats wet after milking, which causes them to become chapped and cracked.

MEANS OF SPREAD.

Mammitis is a contagious disease, readily transmissible from one animal to another. When caused by the *Streptococcus* germ it is especially contagious and will rapidly run through a herd if precautions are not taken. This form is carried from herd to herd and spread about the country through the movement of infected cows, and it is safe to say that the source of infection in an outbreak of this type of Mammitis in a herd is always the udder of a cow that is secreting the germs in the milk, even though the milk may appear to the naked eye to be perfectly normal in character.

The disease is carried from one animal to another, chiefly on the hands of the milkers and on the teat-cups of milking machines. The development of small hard nodules in the teat—commonly known as "pea in the teat"—is a frequent lesion of Streptococcal Mammitis, and cows with this condition are often difficult to milk. Recourse is often had to using a milking tube on them, and this instrument without any effective sterilization may be used on another cow, or on a different quarter of the same cow, and in this way the infection is spread. Infection may also result from the lodgment of germ-laden dust on the udder, especially at or about milking time.

SYMPTOMS.

These depend very largely on the virulence of the invading organism, and may range through every possible degree from very severe to mild. Usually at the outset a change is noticed in one or more quarters—they may become inflamed, hot, swollen, and painful. The milk secretion is diminished and soon changes in character; it may appear watery or blood tinged and contain small clots or curds. Later the clotted material increases and the whole secretion becomes thick and pus-like. "Stripping" becomes difficult, and through inability to remove the discharge, abscesses may form in the quarter and burst to the outside.

In very severe cases the udder may become highly inflamed and discolored, and little or nothing can be got away from the quarters. There is an accompanying disturbance in the animal's general health—she is "off feed," uneasy and feverish, and stands with back arched, hair on end, and is disinclined to move.

In mild cases, all that may be noticed is a transient slight swelling of the affected quarter accompanied by a slight watery or "stringy" appearance of the milk. These symptoms may disappear after a milking or two and give the impression that the animal has recovered. From time to time, however, they may recur, and the quarters gradually undergo a distinct thickening and become light in milk secretion.

Most dairymen are sufficiently conversant with the symptoms of Mammitis to be able to diagnose it readily when the attack is severe and the udder and the milk have undergone marked changes—then one can scarcely help recognising it. What is of much greater moment, however, is to detect the disease in its early stages, especially the very mild forms, so that the necessary control measures can be instituted before the disease spreads to other animals in the herd. With casual observation, these cases may often be overlooked altogether, or, if they are noticed, are thought to be of no great account. It should be recognised, however, that these mild cases are almost invariably cases of Streptococcal Mammitis which is the most highly contagious type of the disease, and they must therefore be treated just as seriously as the more acute forms. Any alteration in the milk should be viewed with suspicion, and if there is any doubt in the mind of any owner regarding a cow he can always submit a specimen of the milk to the Stock and Brands Department for examination.

TREATMENT.

Unfortunately, the curative treatment of Mammitis is still largely unsatisfactory and many failures occur under any known form of treatment. A great deal of benefit and many complete recoveries can, however, be effected by relatively simple methods of treatment if these are carefully carried out. They certainly involve much time and patience, but are nevertheless well worth while.

The first essential is to commence treatment early, and before the sub-acute and chronic stages have been reached; the longer the disease has been in existence the more remote the chances of recovery.

To begin with, the affected animal must be "strictly isolated" in suitable quarters and a dose of laxative medicine given such as 1lb. Epsom salts, ½lb. molasses, 2 tablespoonsful each of nitre and ground ginger, warm water 1 quart. In severe cases the dose of nitre can be repeated daily for three or four days. Diet should be light and laxative.

Local treatment of the udder comprises attention to the following matters:—

(*a*) *Hot Fomentations.*—These should be applied three times a day when the quarters are hot and swollen and should be continued until these symptoms subside. They are best done by applying flannel cloths wrung out in hot water, keeping the water hot throughout. Not less than half an hour should be spent at any one time doing this, and immediately afterwards the quarters should be rubbed over with some camphorated oil to prevent chilling and ease the pain.

(*b*) *Stripping.*—The affected quarters should be stripped out frequently. This is a vital part of treatment and should be done every two hours if possible; the nearer one can approach to doing it this often the better the chances of complete recovery. Stripping reduces the invading army of germs and removes the tissue damaging substances they produce, and by keeping the affected quarters as empty of milk as possible the germs are deprived to a large extent of their food supply, so that they cannot multiply so rapidly. By keeping their numbers down as far as possible in this way the animal's natural resistance to disease is afforded a much better chance of ultimately overcoming the trouble.

(*c*) *Massaging.*—After each stripping the quarters should be well massaged, firmly but gently, working from above downwards towards the teats and using some bland substance such as oil, lard, &c., as a lubricant for the hands and to prevent chafing. After each massaging, again strip out whatever milk has been brought down by this means into the milk cistern.

Stripping and massaging should be persisted in until the milk has returned to normal character.

All diseased milk from the affected quarters should be caught in an old tin or bucket containing disinfectant.

Milk tubes should not be used to empty the quarters, so long as it is possible by patient endeavor to strip them out by hand, but if used they must be thoroughly sterilized by boiling immediately before and after use. If abscesses form they should be opened when ready and bathed and syringed with weak Lysol (1 teaspoonful to 1 pint of water) or some other antiseptic. Should any hardening of the quarters persist, iodine ointment may be rubbed well in once a day.

For some time past considerable attention has been given to the matter of trying to cure Mammitis by means of vaccines, but results have proved very disappointing, and this method of treatment is to date of little value.

PREVENTION AND CONTROL.

Since curative measures are so often of little avail, the prevention of Mammitis is the all important matter to which dairymen should give the closest attention. Vaccine treatment in this connection has again so far proved of doubtful value, and the practice of proper dairy hygiene is still the great essential in controlling the occurrence and spread of this disease.

The matters that have to be constantly aimed at are, (1) the minimising, as far as possible, of the chances of germ invasion of the udder taking place, (2) the protection of the cows from exposure to the "contributory causes of Mammitis," namely, chills, "over-stocking," bruising of the udder, &c.

With these objectives in view, the sanitation and cleanliness of the cowyards and bails and of all utensils must be given strict and unremitting attention. Floors should be kept clean and free from litter, and if they can be regularly flushed down with water so much the better. Walls and partitions of the sheds should be thoroughly scraped down twice a year and fresh hot limewash applied. Milkers should always work with clean hands, and if machines are used, they must be thoroughly and regularly cleaned.

Prior to milking, the udders and teats of the cows should be thoroughly washed with soap and water and then dried with a clean cloth. The water used for these washings should be changed frequently and not kept in use until it becomes a solution of mud and filth. Several cloths should be kept for use and they should be boiled daily.

Where machines are used, before the cups are applied to the teats, all quarters should first be tested by milking a little from each and examining the milk carefully. After removal from a cow and before placing them on to the next one, the cups should be rinsed out with clean water, and should an affected cow be discovered after machines have been used on her, they should be cleaned with hot soda solution before using them on another cow. Care must always be taken to run the machines at proper pressure.

After the cows are milked and before turning them out of the bails, the udders and teats should be washed again in a little disinfectant solution and then dried carefully. This washing after milking is a very important matter, and yet is one that is very infrequently carried out. It clears off any germs and dirt that may have got on to the teats during milking, and it also removes the film of milk that usually gets on to the outside of the teats during milking and which if left there to dry in the wind after the cows are turned out is a prolific cause of cracked and sore teats. It has been definitely proved that there is an intimate relationship between sore teats and the occurrence of Mammitis, and their prevention is a matter to which dairymen must give more attention if the incidence of Mammitis cases is to be kept at a minimum. The washing of the udders and teats with disinfectant solution after milking also serves the useful purpose of disinfecting the milker's hands and so lessening the chances of virulent germs being thereby carried to the next cows they go to milk.

As far as possible, dry milking should be practised in preference to wet milking, and if necessary, the use of a little oil or vaseline as a lubricant is much preferable to the so often practised business of wetting the hands and teats with milk or saliva.

The greatest possible care should be exercised to sustain the vitality of the cows and their udders. One cannot always help weather conditions, and temporary ill health is always liable to happen, but the provision of good shelter and good feed should always be possible, and gentle handling practised. Cows close up to calving should not be allowed to get "over-stocked," and if necessary a little milk should be taken from the udders from time to time. The "drying off" of cows should be done carefully and thoroughly, and the animals should not be turned out and left to dry themselves off so long as they are secreting any appreciable quantity of milk. Improper and careless "drying off" of cows is undoubtedly responsible for many cases of Mammitis occurring when the animals come in again.

Immediately a case of Mammitis is discovered, the animal should, if possible, be strictly isolated until she has recovered. If complete isolation is not possible then she should at least be kept out of the milking shed until all the others in the herd have been milked first, when she can be brought in for treatment. If she is a poor producer she would best be dried off and sold to the butcher; little or no monetary loss will be incurred and it may prevent the spread of the infection to other animals in the herd. One should never handle a Mammitis case just prior to milking healthy animals, and care should always be taken to make sure that an animal that has been affected with Mammitis is thoroughly right again before returning her to the herd.

Finally, in order to prevent the possible introduction of this disease from outside sources, care should always be taken to isolate newly purchased animals for a few days, or at least to milk them last of all until it can be satisfactorily determined by careful manipulation of the udder and examination of the milk that they are free from the disease. It is by no means a sufficient proof that they are all right because on the day they arrive on the premises their milk appears all right. They may just happen to be in the incubating stages of the disease and in a few days' time it "shows up."

MILK FEVER.

"Milk fever" is a disease which affects milking cows usually within a few days of calving—occasionally it occurs shortly prior to that event.

The term "milk fever" is really an inappropriate one since, in fact, there is a complete absence of any fever at all, the animal's temperature being instead almost invariably subnormal at least during the most definite stages of the attack.

OCCURRENCE.

The disease is essentially one of heavy milkers, and it is therefore always one's best animals that suffer. Usually it does not attack a cow prior to her third calving (*i.e.*, when she is reaching the zenith of her production), though cases have been recorded among first and second calvers; and once an animal has had an attack she is liable to have another at her next calving. Many more cases of Milk Fever occur after an easy calving than after a difficult one, and well nourished animals, especially if they have been "dry" for several weeks, are more susceptible to attack than are cows in poor condition.

SYMPTOMS.

These generally develop within a day or two of calving, though they may be delayed for some weeks. Occasionally they may occur before the birth of the calf.

The first indications as a rule are those of unsteadiness, the cow appearing to have lost proper control of her movements. There is a general appearance of uneasiness denoted by continual shifting about or "paddling" of the hind feet, and when made to walk the animal moves with a stagger and may fall down. In some instances the preliminary symptoms are those of nervous excitement—the cow may bellow and rush about wildly, fall down and get up again, bump up against objects, and generally behave as if she has lost the sense of sight and direction.

These early symptoms are soon followed by increasing weakness, and the cow falls to the ground unable to rise, gradually becoming unconscious. In the majority of cases the attitude taken up is characteristic—the animal lying partly on its side, hind legs thrust out or drawn up under the belly, while the head is turned back against the side of the chest. If the head is straightened out and then let go it immediately falls back to its previous position.

Occasionally the animal lies stretched out flat on its side. Usually the eyes are half closed, dull in appearance, with the surface dry, but at times they are completely closed as if the animal is asleep. The animal may groan and grind the teeth, or the mouth may be partially opened, with saliva dribbling away. Paralysis of the throat is present, and the animal cannot swallow. There is also suppression of both bowel and bladder action.

Breathing may be heavy and "snoring" in type. The secretion of milk is diminished, the udder being loose and soft. The temperature may be as low as 95-98°.

As a rule, the general appearance of an animal suffering from Milk Fever is very characteristic, and this together with the history attaching to the attack makes correct diagnosis a comparatively easy matter to anyone who has had any previous acquaintance with the disease.

TREATMENT.

As the course of this disease is as a rule very rapid, treatment should be given as promptly as possible, but so long as there is still a spark of life left in the animal it is "not yet too late."

While there are other treatments available to the qualified veterinary surgeon, the only one that is suitable for the average stockowner is the wellknown one of inflation of the udder. This is an easy simple treatment, and one that has proved wonderfully successful when properly carried out. The procedure to adopt is as follows:—

First remove all milk from the quarters and then thoroughly wash the teats and udder with soap and warm water, or a weak solution of lysol. Then after drying place a clean cloth or towel under and in front of the udder to prevent it and one's instruments being soiled by contact with the ground. The teat catheter or milking tube of the pumping apparatus is then introduced into the teat canal and held in position with thumb and finger while the quarter is pumped up with air until it is uniformly tense. The teat tube is then withdrawn, and to prevent the escape of air the teat can be tied, not too tightly, with a piece of ½in. tape. This procedure is carried out with all four quarters in succession, the underneath quarters being inflated first. After all quarters have been so treated, they should then be gently massaged.

Special Milk Fever outfits are obtainable for inflation of the udder, but an ordinary bicycle pump attached to a valve from a bicycle tube can be used just as satisfactorily. It is essential, whatever the apparatus used, that it be thoroughly sterilised before use by boiling in water for five minutes, and after removal from each teat and before insertion into the next, the milk tube or valve should be rinsed out in a weak solution of lysol. The operator must also take due precaution to clean up his arms and hands thoroughly before starting his work. These antiseptic precautions are all very necessary in order to prevent the introduction of dirt and infection into the quarters which would give rise to an attack of Mammitis.

After the udder has been pumped up, the cow must then be propped up on her chest and a bag of wheat, super, or some other substitute placed behind her shoulder to help keep her in that position. *On no account should she be allowed to remain lying stretched out flat on her side,* otherwise a fatal pneumonia is likely to supervene. She should also be covered over with a good rug or two or several empty bags to get her warm and stimulate body circulation.

On no account should any attempt be made to drench a cow that is down and unconscious with Milk Fever. The animal while in that state cannot swallow, and a drench will almost invariably enter the lungs and cause death by pneumonia. Leave any treatment of this kind until after the cow is upon her feet again.

After inflation of the udder has been performed the animal will as a rule recover in a comparatively short time. If she is not up on her feet within four hours the treatment should be repeated.

When the cow has got up on her feet again after the attack, the udder should not be milked right out for two or three days. If this should be done earlier, the animal is very likely to suffer a relapse and go down with a second attack from which it will be much more difficult to bring her round.

CAUSE OF THE DISEASE.

From time to time many different theories were advanced to account for this disease, but none of them was capable of standing up to scientific inquiry. More recently, Veterinary research workers, notably Professors Russell-Greig and Dryerre, of Great Britain, showed that the actual cause of an attack of Milk Fever was a deficiency of Calcium (or Lime) in the animal's blood stream, occasioned by the sudden transition of the udder from the dry to the lactating stage, with the consequent secretion of large quantities of Calcium in the milk—colostral milk being particularly rich in this mineral element. They showed, briefly, that when a cow was down with Milk Fever, the Calcium content of her blood was from 20 to 60 per cent. below normal; that inflation of the udder with air, by checking milk secretion brought about a rapid rise in blood calcium to normal again, the severity of the symptoms diminishing in proportion as the rise took place; and that recovery from an attack could be very rapidly brought about by the intravenous injection of specially prepared solutions of Calcium.

As a result of the discovery of the real cause of Milk Fever, treatment of cases by means of injections of Calcium solutions is now being practised to a considerable extent by veterinarians with marked success. In the hands of inexperienced persons, however, this method of treatment is extremely dangerous, and may cause death of the animal. For the present, therefore, until this treatment is simplified, "inflation of the udder" must still remain the "sheet anchor" of the stockowner.

PREVENTION.

Up to the present time, no methods have been evolved that will guarantee immunity from this disease, though the recent discoveries of the research workers ir connection with its cause and treatment indicate that if it cannot be wholly prevented there is at least quite a definite possibility of being able to lessen its incidence and the severity of an attack, and it is recommended that Calcium Chloride in 1oz. doses dissolved in 1 quart of cold water be given as a drench once or twice daily for two or three days prior to and after calving. This will provide the cow with a readily available supply of Calcium to help tide her over the "critical period" until her system can mobilise its body reserves of this element and utilise them to maintain the blood Calcium at its normal level.

It is further recommended that two or three days prior to calving, susceptible animals be given a dose of laxative medicine, and that during the first two or three day of milking they should not be milked completely dry.

In order to build up their body reserves of Calcium (and Phosphorus) which have become depleted by long-continued lactation, it is good sound practice to "dry off" one's in-calf cows, if possible, six to eight weeks prior to calving, and during this rest period supply them with a mineral supplement in addition to their ordinary feed. Suitable mixtures for this purpose are:—

1.	Di-Calcic Phosphate	1 part.
	Common Salt	2 parts.
2.	Sweet Ground Bone Meal or Superphosphate	1 part.
	Common Salt	1 part.

These may be used as licks, or be given mixed with the feed at the rate of 1½ozs. to 2ozs. per head daily.

Since Vitamin D is known to exert a very powerful influence in stimulating the absorption of Calcium and Phosphorus into an animal's system, it is desirable, if possible, to provide the animals with liberal amounts of greenfeed (which is rich in this vitamin) in their daily ration.

CONTAGIOUS ABORTION OF CATTLE.

Contagious Abortion of Cattle (or Abortion Disease as it is also commonly known) is a specific highly contagious disease characterised in the main by the act of abortion.

At the present time it is prevalent in practically every country in the world, causing tremendous economic loss to dairy farmers through the loss of aborted calves, diminished milk yield of aborting animals, and, in many animals, sterility. Its incidence in our dairy herds of South Australia is unfortunately high and tending to rapidly become still higher, and in their own interests owners should take more active steps to control its ravages than they have hitherto taken. There is still far too great a tendency in general on the part of dairy cattle owners to attribute their early cases of abortion to accidental causes, and to do little or nothing in the matter until it is too late. While Abortion may occur as the result of accident, rough handling of cows while heavy in calf, or as a sequal to other diseases, it should be realised that such cases are very few and far between. By far the vast majority of Abortions that occur in dairy cattle are caused by this specific infection, and the wisest policy for any owner to adopt is to treat every case as contagious until definite proof to the contrary can be obtained.

Cause of the Disease.

The disease is caused by a small germ known as *Brucella Abortus,* or the Bacillus of Bang. When this germ gains entry into the body of a pregnant animal it locates itself in the uterus (or "breeding bag"), where it rapidly multiplies and sets up a catarrhal inflammation of that organ, which results ultimately, as a general rule, in expulsion of the foetus (or calf). In the non-pregnant animal it locates itself in the udder, where it remains until the cow becomes pregnant, when it passes into the blood stream and is carried to the uterus.

The germ will live in these two organs, viz., the uterus and udder, only when they are functioning. In other words, it does not find them a suitable habitat in an animal that has never been bred. Hence there is little danger of heifers contracting the disease until after they have been put to the bull. As soon as they become pregnant, however, they become highly susceptible to infection. Viable calves born of infected cows do not become permanently infected, although at the time of birth they harbor innumerable germs in their digestive organs as the result of swallowing some of the foetal fluids. These germs rapidly disappear from their systems through being passed out in the faeces.

The foetus, afterbirth, and uterine discharges of an infected cow all literally teem with abortion germs, and these, in practice, constitute the highly dangerous media for the further spread of the disease. After the expulsion of the foetus the germs persist in the uterus for several weeks—on the average about two months—after which they leave that organ and locate themselves in the udder, where they remain until the animal again becomes pregnant.

Methods of Infection.

At one time it was commonly believed that infection took place *via* the route of the genital track, and the bull was held to be mainly responsible for spreading the disease through mechanically transferring infective material from the vagina of one cow to that of another by the act of "service." It is now known that although infection can take place by the vaginal route, it is not common, and the role of the bull as a spreader of the disease is a subsidiary one only.

By far the most frequent path of infection is by the mouth—through swallowing food and water which has been contaminated by the uterine discharges from infected cows, and in practice, grazing over contaminated pastures constitutes the chief means by which susceptible animals contract the disease. They may also become infected through licking the hindquarters of cows soiled by infective uterine discharge.

So far as the bull being the means of spreading the disease through "service" is concerned, the dangers are limited mainly to the following:—

(*a*) If allowed to serve infected cows with a discharge, he may passively transfer some of this to the hindquarters of other cows subsequently served from where it can be licked off by susceptible healthy animals.

(*b*) Occasionally a bull will become systemically infected, when he will harbor the germs in his genital organs and passages. Through his use for "service" a leakage of possibly infected semen from his penis or from the vaginas of cows he has served may contaminate the feed and drinking water of the herd or the hindquarters of the cows.

Experimentally it has been proved that infection can take place through the conjunctiva of the eye, and through wounds in the skin, but these are probably not common routes in practice.

COURSE OF THE DISEASE.

The usual result following infection is Abortion. Some cows, however, may become infected, and yet never at any time abort, and because they do not do so they are never suspected of being infected. Yet at each calving they can actively spread the disease and consequently act as "carriers."

After aborting once or perhaps twice, an infected cow will usually carry her subsequent calves to full term. This must not, however, be taken as an indication that she has thrown off the disease and is no longer a danger to other susceptible healthy animals. Once a cow has become infected with Abortion Disease she remains so for the rest of her life with very few exceptions, and although she becomes "tolerant" to its ill effects she is still just as active a spreader of it at each and all of her subsequent apparently normal calvings as she was when she first aborted.

SYMPTOMS.

An animal affected with this disease usually displays practically no symptoms until the act of abortion takes place, though, in come cases, she may give some premonitory signs of "springing." If abortion should occur early in the pregnancy it may pass unnoticed, and the first intimation of anything untoward is the "return" of the animal to the bull when she was thought to be safely in calf. This point should be remembered by owners, as early abortions are not uncommon, particularly in heifers. The "return" of the animals to the bull is usually not connected with Abortion disease but thought to be merely a "failure of the young stock to breed," and without any attempt to clear up the matter they are put to the bull again at the first opportunity.

When abortion takes place in the later stages of pregnancy the foetus is usually dead when expelled, and in the majority of cases the foetal membranes (or "afterbirth") are retained. There is a discharge from the uterus of a dirty yellowish-brown colored fluid which is often evil smelling and frequently persists for some weeks.

WHAT TO DO IF A COW ABORTS.

If an animal aborts in a herd that has hitherto been free of such events, she should be suspected of being infected with Contagious Abortion and immediately isolated. The aborted foetus and "afterbirth" should be destroyed by burning or burying in quick lime, and if the abortion occurred in the paddock the ground where it happened should be covered liberally with lime or some disinfectant. If it occurred in a stall to which other cattle have access this should be thoroughly disinfected and any litter or bedding burnt. The cow should be kept in strict isolation until the point is decided whether she is infected or not, the vaginal passage douched out daily with lukewarm ½ per cent. lysol solution or a weak Condy's solution, and all discharges and bedding disinfected before removing them from her quarters.

Take a sample of her blood and forward it to the Chief Inspector of Stock, Adelaide, for testing.

To collect the blood sample, clip hair at tip of tail and with a sharp knife make a cut ½in. to ¾in. long at the tip on the under surface. The blood can be caught in a bottle that has previously been sterilised and thoroughly dried. About an ounce (2 tablespoonfuls) should be collected, and after it has clotted in the bottle shake or strike the bottle sharply with the hand to loosen the clot from the sides so that it can contract and allow the serum to separate out. Then post sample on without delay. If the sample has to be sent from a great distance or the weather is hot it is preferable to leave the blood stand for some time and then decant the clear serum off into another clean dry bottle and send it only along—this is all that is used in making the test.

If possible the animal should be handled and treated by an attendant who does not handle the milking herd, and on no account should it be put to the bull before the result of the blood test is known. If this should be "positive," then control measures should be instituted with the herd.

CONTROL.

There is as yet, unfortunately, no known cure for Contagious Abortion, though many "nostrums" have been placed on the market from time to time for use in this direction. Vaccines of various kinds have also been tried without success. Once the disease has got into a herd all that can be done is therefore to apply suitable measures of control to prevent it from spreading to animals that it has not yet reached, and to work, where possible, towards ultimately eradicating it from the herd.

When the disease has made its appearance in a herd, the soundest step at the outset is to take samples of blood (in the manner previously described) from every animal of breeding age—male and female—in the herd and have them submitted to a special test known as the Agglutination test, by means of which infected animals can be singled out from non-infected ones with a great degree of accuracy and the point determined just how the herd stands with respect to infection. This knowledge is of great assistance in enabling an owner to decide what measures of control to adopt to deal with the disease.

The methods available for the control of Contagious Abortion fall into three main groups or schemes. In setting these out it is not possible on paper to deal with the varying factors which may affect their adoption on different farms—all one can do is to indicate the general principles in the hopes that individual owners can adapt them to suit their particular case. (An owner is always at liberty when in Adelaide to consult the Veterinary Staff of the Stock and Brands Department and discuss his problem in detail with them).

The schemes are respectively—(1) The Elimination Method. (2) The "Two Herd" Method. (3) The Isolation Method.

1. *The Elimination Method.*

Under this plan, all infected animals as they are detected by means of the blood test are immediately disposed of off the place.

After the disposal of the infected animals ("postive reactors") detected by the initial blood tests of the whole herd, the remaining cattle ("negative reactors") should be moved to fresh pasture away from any possible infected area, the pasture where the "reactors" were grazing being either cultivated or left unoccupied for six months to rid it of any possible infection before re-stocking again with susceptible animals. Fresh, clean milking premises should be established, or if this is not practicable the old premises thoroughly disinfected.

To detect any animals that may have been incubating the disease and which gave a negative or doubtful reaction to the first test, further blood samples are taken at intervals of four to six weeks, and this testing continued until on three successive occasions all animals give a negative reaction. The herd can then be considered to be free from the disease, and precautions should be taken to ensure that the disease is not re-introduced through any new purchases.

Any calves from infected cows can be handled as set out in Method No. 2.

This plan is applicable to herds where the blood test of all animals shows that the incidence of the disease in the herd is low, and although it may seem to some a drastic method, it is undoubtedly the most satisfactory one to employ in such herds, as by it it is possible to quickly eradicate the disease with a minimum of economic loss.

2. *The "Two Herd" System.*

Under this plan all infected animals are kept on a separate portion of the farm away from the non-infected ones so that the farmer has actually two herds—one infected and one free from Abortion.

When the result of the whole-herd blood test is known, the "positive reactors" are retained on that portion of the farm in use at the time and the remainder ("non-reactors") removed to a clean pasture. If possible, separate watering facilities should be provided for them, also separate milking premises and attendants who do not handle the infected cattle. If, however, all cattle have to be milked in the same shed the infected herd should always be milked last and the shed and all utensils subsequently cleaned and disinfected. Further samples of blood from the herd of "non-reactors" should be tested every four to six weeks, and any animal found reacting immediately transferred to the dirty or infected herd.

As calves born of infected mothers do not retain the infection, they can be kept and isolated until a few weeks after weaning, when, their blood having been tested and proved negative, they can be transferred to the clean herd.

The infected herd will, of course, be gradually disposed of as they outlive their usefulness, and the young stock grow to replace them, and ultimately an abortion free herd will be obtained. It is necessary, of course, after the last of them have been disposed of, to ensure that the pasture occupied by them is left for six months to get rid of infection before running the clean herd on to it.

If the infection is so widespread in a herd that there are but few clean animals in it, the whole herd could from the outset be considered simply as an infected herd and the disease allowed to run its natural course amongst the mature stock. A small clean portion of the farm should be left for the nucleus of a clean herd, which would consist of the heifers that have not reached breeding age and weaned calves that have given a negative blood test.

The future clean herd would then be gradually built up with the further calves of the infected mothers, and with the gradual weeding out of the infected mature stock the disease ultimately eliminated from the premises.

It would be necessary, of course, by simply anticipating requirements, to gradually increase the extent of clean pasture on the farm to accommodate the growing abortion-free herd.

This system is applicable to herds where the few infected cattle in them are too valuable to be summarily disposed of as in Method No. 1, or where the incidence of the disease is too high to allow of that plan being practicable. The owner must, of course, have the facilities for running the two herds so that they do not come in contact.

It must not be forgotten that the bull is an important factor in both of these two methods, and if possible only a known clean one should be used with the abortion-free females. His blood should be tested from time to time, and if found "positive" he should on no account be used any further on them. He should be kept confined to his own yard or paddock, and all "service" should be under control.

3. *The Isolation Method.*

This method of control can be used in herds in which the disease is fairly widespread and the general circumstances such that neither the elimination nor the "two herd" system is practicable. It has the serious objection that it only aims at keeping the ravages of the disease in check, while allowing it to remain in the herd. It is necessary to discuss it, however, since it is probably the only way the disease can be handled in many infected herds in the State.

The plan is based on the facts set out earlier regarding the means by which the disease is spread from one animal to another, and consists of so handling the herd that escaping Abortion germs from infected animals will have the least opportunity of being picked up by susceptible healthy ones.

In handling Abortion by this method it is necessary to set apart portion of the premises to be used solely for "calving" purposes, and these quarters should be so placed that infective material cannot drain from them and contaminate the feed and drinking water of the herd. Every breeding animal in the herd must be treated as a possibly infected animal and be removed to these quarters before she is due to calve, or immediately she shows any signs of impending abortion. For the purpose of detecting any "aborters" in good time so that they can be got away before they have a chance to infect the pastures through their uterine discharges, it will be necessary to keep a close regular watch over all "in-calf" animals, especially heifers.

Every animal, whether she calves normally or aborts, should be douched regularly and kept segregated for at least four to five weeks after all discharges have apparently ceased. All by-products of abortions and normal calvings and bedding should be effectively disposed of and the premises finally disinfected after each time they are used. Care should be taken to avoid carrying infective material on the hands and clothing after attending to the animal.

The bull should be kept in his own yard and not allowed to run with the herd. He should not be allowed to serve any cow within two months of her aborting, or any cow with a discharge. His sheath should be douched with antiseptic solution after each "service."

Calves should be kept in their own special yards and not allowed to run with the cows for some weeks after they have been weaned.

The milking premises of the herd should be kept clean, and if any milk is spilt on the floor the place where it happened should be covered with lime or other disinfectant.

While aborting animals that are not really profitable may be fattened and disposed of—those that are of especial merit need not be immediately got rid of under this plan. In fact they are better retained unless they prove sterile, for most of them will probably never abort again, and they can be handled without much danger of their spreading infection. By keeping them as long as they are profitable, the necessity of bringing in fresh possibly susceptible animals from outside to keep up the strength of the herd is avoided as much as possible, and in this way the disease is not kept so "active" and its ravages are reduced to a minimum.

PREVENTION.

Where a herd is clean the fullest precautions are necessary to prevent possible entry of the infection. The greatest danger by far is that the disease will come in through the medium of additions to the herd. The fundamental procedure of prevention in this connection is to raise sufficient heifers to replace adult animals. If outside purchases have to be made, buy only from known clean herds, or buy animals between weaning and breeding ages. If adult animals have to be purchased (which is usually necessary at some time or other), they should be strictly isolated until two blood tests at four to six weeks' intervals prove to be negative. It is not sufficient to isolate new females until they have calved as normal calving is no proof that they are "clean."

The bull in a clean herd should be limited to use with the cows of the herd if possible and not used for service with outside cows.

If untreated milk and other factory by-products are brought on to the farm for feeding to calves and pigs precautions should be taken against the possible introduction of infection in them. They should be sterilised by boiling and also the "containers" used for collecting them from the factory.

THE PATERSON SCHEME.

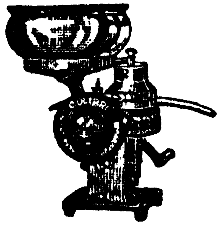
[By A. J. Cooke (Vice-Chairman, Advisory Board of Agriculture).]

(Paper read at the 43rd Annual Congress of the Agricultural Bureau.)

The Paterson Scheme has been in operation now for a number of years, and although much publicity has been given to the great benefit that it has been to the dairying industry in Australia, there are still some dairy farmers, commercial men, and others who, through the press and on the public platform, criticise the operations of the Scheme, and appear to think that it is a burden rather than a benefit to dairymen of this State.

Briefly let us examine the position. Is the Paterson Scheme justified? What is it? How does it operate? It is first necessary to draw attention to the conditions of the dairying industry some years ago before the marketing scheme was put into operation. At that time dairymen had to accept, for a large and constantly increasing portion of each year, export parity rates, not only for butter they sent overseas, but also for what they sold in Australia. That rate invariably ruled the local price when there was an exportable surplus.

When butter supplies were short it was possible to get a little more for the butter on the local market, but about the time this scheme was introduced the industry had developed to such a point that there was an exportable surplus nearly all the year round in some part or other of Australia. So great is the range of climate throughout Australia that the butter export season now extends throughout the entire year. The result was that no State, even though it had not an exportable surplus, could get



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much above export parity rates for its butter, because the local price was limited by that at which the nearest exporting State was able to land its butter in its neighbor's market.

Some years ago the position had become acute. The dairymen were paying Australian prices for everything they used in their homes and on their farms, and these prices, due largely to our fiscal policy and artificial living standards, are 25 to 50 per cent. higher here than in Great Britain. Thus the dairymen were paying more than 25 to 50 per cent. above world prices for what they had to buy, and were receiving 20 per cent. less than world prices for what they had to sell.

EXPORT PARITY.

Export parity rates means considerably less than world prices. That point is seldom grasped by economists. Export parity rates are world prices, less all costs incidental to transporting goods, perhaps 12,000 miles, less loss from deterioration in transit, and less insurance and other charges. Before this marketing scheme came into operation export parity prices were 2d. to 3d. per pound less than world rates. The dairyman received this reduced price, not only for the butter he exported, but also for what was sold in the home market.

When world prices collapsed about six years ago the position of primary producers in Australia became very serious, as the policy of high tariffs and high labor costs made it impossible to reduce costs of production to correspond with the continual downward drift in prices of primary products. The process of deflation in values of butter is illustrated in the following comparison of average prices of Australian choicest quality butter in London during recent years:—

	Per cwt.	
	s.	d.
1921	285	8
1925	180	8
1928	165	0
1929	171	0
1930	153	5
1931	110	0
1932 (first six months)	100	0

When the heavy decline in London butter values definitely set in, it became imperative to assist Australian dairymen and as, for political reasons, it was impossible to secure drastic revision of tariff duties and labor costs, it became urgent to find some method of affording quick and substantial relief. Many schemes were suggested, mostly involving complicated and controversial legislation and expensive organisations, but at last the Paterson scheme was formulated, and was soon recognised as the only practical and inexpensive way of rendering immediate and material assistance to producers.

The Paterson scheme is a purely voluntary one on the part of the producer; it is the farmers' own scheme, but the farmers must be loyal to one another, and its success depends entirely upon all Australian butter factories without exception contributing the levy of 1¾d. per pound on all butter manufactured, so as to enable the export bounty varying from 2½d. or more per pound to be paid, for it is only by the payment of these bounties that Australian butter prices can be raised correspondingly above London parity prices. By securing these higher prices on all butter consumed within the Commonwealth, factories are enabled to pay suppliers at least 2d. per pound more for butterfat than could be paid without the scheme. Taking an average production per annum of butterfat per cow at, say, 250lbs., this extra payment by factories represents an increased return per cow per annum of £2, which for a herd of 50 cows amounts to a total increase in annual income of £100, without the slightest increase in the dairy farmer's cost of production. In the case of very many producers, this additional income means a small profit in place of a loss on the year's returns.

Since its inception, the Paterson scheme has actually placed into dairymen's pockets millions of pounds in hard cash at practically no cost for its successful administration. It is obvious, therefore, that it is of supreme importance to dairy farmers throughout Australia to have the scheme maintained. It would be disaster to the dairying industry if the Paterson plan broke down.

THE LEVY.

Under this scheme a levy of 1¾d. per pound is voluntarily paid on every pound of butter produced, and that goes into a fund from which the bounty is paid on butter exported. It may be asked what advantage is derived from that? It certainly looks, on the face of it, like robbing Peter to pay Paul—as if the dairymen were taking money out of one pocket and putting it into another. In practice, however, that is not so. The direct result of the payment of an export bounty is that automatically, without any regulation, or compulsion, or legislation, the local price through the operation of an economic law rises to the level of the export price, plus the amount of the bounty paid.

It cannot be otherwise. It is a case of making use of an economic law instead of fighting it.

Had the butter industry tried to fix an arbitrary price for the local market, that price could only have been maintained by setting up elaborate machinery to compel every butter factory to take its fair share of both the export and local markets. That would have been a very difficult undertaking, and the administration costs would have been greater per dairyman than 9d. per annum.

During the past year, ending June 30th last, the total production of butter in Australia (excluding that of Western Australia, and also excluding the production of farm or dairy butter) was approximately 161,000 tons for the Commonwealth, whilst the approximate export for the same period was 92,000 tons for 12 months ending June last. This is a very big advance over production and export of the past season, which was 72,000 tons approximately exported for 1931.

Taking the levy of 1¾d. per lb. on butter manufactured, on 170,000 tons it would pay a bonus of 3d. per lb. on an export of 98,000 tons.

I purposely draw attention to this fact, because it has been said that the scheme will soon become useless.

This is not quite true in fact, as the levy of 1¾d. could be increased, and it would enable the 3d. bonus to be continued and will give in net results a substantial benefit to the dairying industry.

My contention is that until such time as all Australian industries are prepared to sell their productions at export parity rates, and all other industries in Australia are on a purely competitive level, we must insist on keeping the Paterson scheme going in the interests of dairymen, who, as a matter of fact, are at a dead end in high tariff legislation, and are quite unable to pass on the increased cost of production with which they are at present burdened.

RESOLUTION.

During the discussion which followed Congress decided, at the instance of the Redhill Branch, "That cream should receive better attention when delivered to railway stations." Delegates voted against resolutions from the Frayville Branch, "That the Dairy Act be amended" and "That cream be tested for commercial butter instead of butterfat."

MAXIMUM BREEDING.

The first essential is to resume breeding for quality with all possible haste. For the time being we are not in a position to discriminate to any great extent, owing to limitations both regarding mares and sires. Allowing 40 per cent. as an estimate of the percentage of mares of the total number of horses in the State, we have approximately 73,000 mares of a kind from which to breed, and with a further allowance for light horses included in that number, there would probably not be more than 70,000 mares. It is certain that many of these mares will never again carry a foal, neither have we sufficient sires to cover them. In the absence of official figures since 1920-21 it is estimated the number of draught stallions would not exceed 500. Therefore we are limited in discrimination a great deal in breeding where sires are available until such time as numbers are considerably increased, both for mares and sires, and it is evident that with the best possible effort it would take 10 years to restore the numerical strength to 250,000 without fairly heavy importations from outside.

QUALITY.

During the accomplishment of that objective of 250,000 horses there must be a growing attention to quality of breeding. With the exception of a few years prior to and during the war, our exports have not exceeded the number of importations. But with climatic conditions so admirably adapted for horse breeding, we should endeavor to obtain a standard of breeding which will enable us to secure a reputation capable of attracting export business. We have not achieved average quality to compare with the horses of New Zealand or even Victoria, and I see no reason why such should be the case. It is of the utmost importance that we exercise care and judgment in the selection of a stallion, and see that he is possessed of no hereditary weakness, of sound constitution, and true to breed. In this respect it would be of material advantage if all stallions were registered subject to a certificate of soundness from a Government Veterinary Officer. The fees collected from this source should be earmarked as a special fund to be used as subsidy within the industry, to which I shall refer later.

METHOD OF ATTAINMENT.

To suggest methods of improved breeding with due consideration to both quantity and quality, which could generally be accepted and applied, is a problem requiring a great deal of consideration in detail. In a paper given at our local Branch of the Bureau some 12 years ago I introduced co-operative ownership of entires. There are difficulties I admit, there is the question of responsibility, care of the animal, and efficient service. We saw all the difficulties in the scheme, and there it ended, and we continued to rely on the initiative and enterprise of a few horse lovers, however inefficient, and we have reached a crisis. Nevertheless, I am pleased to learn that co-operative sires have been working successfully, in spite of the drawbacks which may exist, and but for them the position would be worse. The question of sires has recently received attention quite frequently at Agricultural Bureau District Conferences, and the usual recommendation has been to the effect that Government should subsidise stallions on the same basis as it subsidises pedigreed bulls of good milking ancestry. It is overlooked that bull subsidies are defrayed from the accumulated licence fees of all the bulls of the State, and that whilst bulls are many, and individual subsidies relatively moderate, the reverse would be the case under either head for stallions.

Another objection to the proposal is that a stallion expected to travel the district should be in the hands of a specially qualified man, and whilst men of this type are to be found in some districts they are not common, nor, as a rule, can they afford to neglect their own farms for the benefit of their neighbors.

PROFESSOR LOWRIE'S SCHEME.

The Advisory Board of Agriculture realised the importance of sufficient and suitable sires, and appointed a small sub-committee to go into the matter. We came to the conclusion that the scheme proposed by Professor Lowrie in 1911 with possible modifications would give better results. Briefly his proposal involved the forming of horse-breeding societies, which were to be subsidised through 50 per cent. of the totalizator percentages being earmaked for that purpose.

The nuclei of these societies may be the Agricultural Bureau, Show Society, or even a committee of farmers in any district. The scheme involved a Government subsidy of £2 for every £1 raised by the society, with a maximum subsidy of £200. It did not, however, involve the purchase of a stallion for local use, but the offering of adequate moneys and fees in order to induce owners of approved sires to travel the district in which the horse-breeding societies were formed. The suggestion was to pay a fee at service, and a further sum to be paid by the society according to the number of foals left, at a given sum per foal. Such a scheme has much to recommend it, and should prove acceptable to both farmers and sire owners if the subsidy were obtainable. It is a matter of vital importance to the State, and which the Government might assist, but we realise that on financial assistance the Government cannot be approached to-day.

The matter of collecting an amount to provide subsidy would have to be through the medium of a tax which could only be applied fairly to horses at a given amount per head on horses within the counties. This means of providing the necessary revenue would not fall very heavily on the industry concerned, and with registration fees for draught entires earmarked for the same purpose would possibly not exceed 1s. per head.

The difficulty in collecting the tax without evasions and doing so economically rather prejudices such a scheme, and we have not reached finality in a recommendation applicable to the State as a whole.

CONCLUSION.

It may be said that I have failed to put up a complete proposal which will achieve the objectives set out in the title of the paper. To some extent that may be true, but if any impression has been created in the minds of those assembled of the pressing need for greater diligence and energy being applied to horse breeding, with a view to safeguarding and improving the present rate of rural production, our time has been well spent. I consider any upward movement in horse breeding throughout the State depends upon some such scheme to improve the methods of draught stock breeding.

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FORTY-THIRD ANNUAL CONGRESS.

The Forty-third Annual Congress of the Agricultural Bureau of South Australia was held in the Way Hall, Adelaide, on September 12th, 13th, and 14th, and the record attendance of delegates can be taken as an indication that interest in the work of the Bureau is being maintained.

Congress was opened by His Excellency the Governor-General, Right Honorable Sir Isaac Isaacs, P.C., G.C.M.G., on Monday, September 12th, at 8 p.m. Mr. H. N. Wicks (Chairman of the Advisory Board of Agriculture) presided, and amongst others present were Hon. S. R. Whitford, M.L.C. (Minister of Agriculture), Professor A. J. Perkins (Director of Agriculture), Members of the Advisory Board of Agriculture, and officers of the Department of Agriculture and the Waite Research Institute.

The following delegates attended:—*Alawoona*—B. L. Finey (4), T. Willson (4); *Aldinga*—G. Sheriff (3); *Allandale East*—H. Kerr (5), R. Kerr, jun. (6); *Angaston*—Wm. Sibley (2), Wm. Patching (3); *Arthurton*—Geo. Hicks (0), S. Henderson (3); *Ashbourne*—K. M. Horwood (0), C. J. Pitt (3); *Auburn Women's*—Miss Dennison (4), Mrs. J. Morcom (4); *Balaklava*—A. F. Smart (5), W. P. McPharlin (5); *Balhannah*— — Norsworthy (2), H. Rollbusch (3); *Balumbah Women's*—Mrs. A. Ellis (5); *Belalie Women's*—Mrs. M. Bailey (5), Mrs. C. R. Hawke (5); *Belvidere*—H. A. Eckert, jun. (4), M. S. Pearce (5); *Berri*—A. G. Jarvis (4),A. W. Magarey (4); *Blackheath*—H. Paech (5); *Black Springs*—J. M. Howard (3), Roy Turner (4); *Blyth*—H. A. Zweck (2), L. C. Mugge (2); *Bowhill*—M. A. Cockshell (0), A. J. Spry (2); *Boors Plains*—T. A. Stanway (2), K. K. Queale (2); *Borrika*—H. S. Green (6), C. S. Wardley (2); *Brentwood*—E. E. Twartz (0), J. Honner (1); *Brinkley*—W. H. Schubert (0); *Brinkworth*—H. E. Ottens (3), H. E. Wundke (3); *Brownlow*—A. O. Steinborner (4), C. A. Materne (4); *Buchanan*—W. J. Armstrong (3), L. V. Bell (0); *Bugle*—E. T. Smith (0), J. C. Scott-Todd (1); *Bundaleer Springs*—T. Cleggett (4), M. J. Cronin (3); *Bute*—E. H. Ebsary (6); *Butler*—A. H. Pfitzner (4); *Caloa*—J. H. Kelsh (4), F. L. Roberts (3); *Caliph*—J. W. Burnett (2), W. H. Todd (3); *Chandada*—R. R. Loveday (0), R. H. Ross (3); *Cherry Gardens*—B. B. Ternan (1), R. Jacobs (1); *Clanfield*—L. Orwell (4), S. Orwell (3); *Clare Women's*—Mrs. J. C. Dux (1), Mrs. A. H. Rogers (2); *Clarendon*—E. H. Harper (0), T. B. Brooks (3); *Cleve*—F. G. Hauschild (5), A. V. Preiss (3); *Collie*—H. Shipard (4), D. J. Gunn (4); *Coomandook*—F. E. Ballard (4), W. R. Trestrail (3); *Coonawarra*—W. L. Redman (5), E. G. Allder (5); *Cungena*—C. L. Ayliffe (5), S. H. Bennie (5); *Dudley*—A. G. Telfer (2). E. Dall (2); *Elbow Hill*—John Rehn (4), W. T. Cooper (4); *Eurelia*—M. P. Dinon (3), E. H. Hall (3); *Eurelia Women's*—Miss R. Kildea (4), Mrs. E. P. Wall (4); *Everard East*—F. C. Hughes (5); *Finnis*—M. Llewellyn (2); *Frayville*—C. R. Banks (4), S. A. Bretag (4); *Gawler River*—E. Leak (0); *Geranium*—E. G. Williams (0), L. S. Prouse (5); *Gladstone*—J. W. Prior (3), C. R. Bennett (3); *Gladstone Women's*—Mrs. E. C. Pritchard (4), Miss M. J. Sargent (4); *Goode*—C. P. Linke (5), J. H. W. Cooper (5); *Goode Women's*—Mrs. D. Fagen (5); *Green Patch*—C. J. Whillas (4); *Greenock*—E. Keller (5), E. J. Helbig (3); *Gumeracha*—W. L. Hanna (0), John Porter (0); *Hanson*—C. P. Turner (3), W. J. Woollacott (1); *Hartley*—T. G. Jaensch (2), W. J. Lawton (2); *Hindmarsh Island*—C. F. Kightley (3); *Inman Valley*—R. J. Gregory (3), H. L. Lush (4); *Jamestown*—W. C. Glasson (3); A. J. Symonds (4); *Jervois*—E. Schultz (4), M. Wilkin (4); *Kalangadoo*—R. G. Messenger (5); *Kalangadoo Women's*—Mrs. L. R. Davies (4), Mrs. R. G. Messenger (5); *Kanni*—F. W. Woodhead (3), H. E. Krohen (2); *Kapinnie*—Chas. Luckraft (2); *Kalyan*—R. E. R. Lang (6), H. R. Norman (1);

Kangarilla Women's—Mrs. J. White (3), Mrs. G. Thorpe (3); *Kareultaby*—J. A. Freeman (3), A. W. Rutherford (4); *Keith*—T. A. Dickson (5), A. M. Densley (3); *Ki Ki*—O. Blucher (5), F. Griffiths (2); *Kilkerran*—B. A. Koch (3); *Kongorong*—C. T. Atkin (4), F. C. Caine (4); *Koolunga*—J. H. Button (3); *Koonunga*—J. Mickan (3), A. Hermann (4); *Koppio*—V. W. Gardner (5), B. G. Low (4); *Kulkawirra*—D. A. Oakley (2), O. N. Fitzgerald (2); *Kyancutta*—J. J. Dyke (6), M. M. O'Brien (5); *Kybybolite*—W. Staude (1), D. Quinn (2); *Lameroo*—J. L. Koch (5), C. R. Eime (5); *Langhorne's Creek*—N. S. Wheller (5); *Laura*—F. Neate (4), Chas. Amey (3); *Laura Bay*—E. D. Barnett (5), W. L. Edson (5); *Light's Pass*—A. J. Summers (5), T. W. Roenfeldt (2); *Lipson*—C. J. Partington (2); *Lone Pine*—E. R. Hentschke (4), S. M. Turnbull (4); *Lone Gum and Monash*—E. N. Hall (2), H. March (2); *Lyndoch*—W. H. Lawes (1); *Macclesfield*—Ken Bowen (0); *McGillivray*—E. C. Seager (3), J. N. Wood (2); *Maltee*—J. Bassham (6), E. Schwarz (5); *Mangalo*—M. Hannemann (3), A. Turner (4); *Mangalo Women's*—Mrs. A. E. Lathlean (3), Mrs. F. Coles (3); *Marama*—T. A. Hailes (5), H. L. Whitford (2); *McLaren Flat*—C. Robertson (2), Geo. Connor (1); *McLaren Flat Women's*—Mrs. K. Warrenn (0), Mrs. C. Robertson (5); *Milang*—H. Matheson (3), A. Matheson, jun. (4); *Millicent*—R. Hateley (5), C. Hutchesson (5); *Millicent Women's*—Mrs. P. Sullivan (5), Mrs. S. D. Williams (5); *Miltalie*—F. Coles (6), J. P. Story (4); *Minnipa*—S. C. Billinghurst (3), D. V. Kitto (4); *Modbury*—W. H. Pitman (1), L. J. Wicks (0); *Monarto South*—L. M. Thiele (4), P. B. Frahn (6); *Moorlands*—R. Nicholls (5), R. R. Wilmshurst (5); *Moorook*—S. Perkins (4), E. A. Liddicoat (2); *Morchard*—M. A. Brown (5), B. S. McCallum (5); *Mount Barker*—W. T. Stephenson (2); *Mount Bryan*—A. A. Jefferies (5), W. H. Quinn (3); *Mount Compass*—M. Jacobs (0), B. Proctor (3); *Mount Gambier*—A. J. Hemmings (4), G. T. Gurry (6); *Mount Hope*—J. H. Vigar (4); *Mount Pleasant*—P. S. Davey (0), F. R. Ayers (0); *Mudamuckla*—V. V. Brandon (2), E. Whyborn (5); *Mundalla*—L. M. Dinning (6), F. V. Trenorden (3); *Murray Bridge*—A. Wells (5), F. Lehmann (2); *Murraytown*—E. B. Pitman (5); *Myponga*—C. A. Martin (3), J. J. Muller (2); *Nantawarra*—K. W. Young (3); *Narridy*—T. R. Welbourn (3), H. B. Cox (2); *Narrung*—P. W. Thacker (6); *Nelshaby Women's*—Miss R. I. Haines (4), Miss A. M. Lawrie (4); *Nelshaby*—E. H. Williams (5), F. Desilver (5); *Netherton*—F. Hosgood, sen. (5), C. P. Wilkin (4); *Nunjikompita*—P. A. Luestner (4); *Nunkeri*—J. R. Ling (0); *Overland Corner*—C. C. Bartel (4), H. A. Loffler (5); *Owen*—A. J. Freebairn (3), S. Lacey (4); *Palabie*—E. H. Rashleigh (5), A. Miller (6); *Parilla*—A. W. Welden (5), S. A. Gregory (5); *Parilla Women's*—Mrs. L. Foale (2), Mrs. A. W. Welden (4); *Parilla Well*—V. E. Venning (3), W. H. Simpson (4); *Parilla Well Women's*—Mrs. E. C. Slater (5), Mrs. M. S. Davis (4); *Parrakie*—W. J. B. Halliday (4), W. Watts (5); *Parrakie Women's*—Mrs. M. J. White (6), Miss Hamilton (5); *Paruna*—A. C. Webb (3), A. A. Petch (1); *Paskeville*—M. K. Lamming (5), F. J. Rundle (5); *Penola*—H. B. H. Richardson (2), F. W. Hinze (5); *Penola Women's*—Mrs. F. J. Kidman (3), Mrs. W. A. Clifford (6); *Penwortham*—A. T. Duke (6), J. H. Richardson (1); *Petina*—H. H. Howard (3), W. E. Stone (2); *Pinbong*—H. B. Scholz (5), H. M. Johnson (6); *Pinkawillinie*—B. Hudson (4), S. C. Johnson (4); *Pinnaroo*—A. F. Young (3), C. R. Mattiske (5); *Pinnaroo Women's*—Mrs. W. B. Davis (3), Mrs. A. T. Hawthorne (5); *Port Elliot*—F. C. Keen (3), J. P. Colebatch (5); *Pygery*—E. H. Edmonds (4), B. G. Heath (5); *Quorn*—O. C. Noll (0), C. J. Easther (4); *Ramco*—Robt. Stanley (3), J. Boehm (0); *Redhill*—J. V. Dundon (3), H. J. Crouch (5); *Rendelsham*—F. E. White (6), V. A. Smith (4); *Renmark*—M. B. Geneste (3); *Richman's Creek*—W. J. Kelly (3); *Roberts and Verran*—R. A. Paxton (4), J. T. Hancox (4); *Rosedale*—S. Simcock (1); *Rudall*—W. Wake (4), R. M. Crabb (3); *Saddleworth*—F. W. Colman (3), A. J. Marrett (1); *Saddleworth Women's*—Mrs. F. Coleman (4), Mrs. G. Crawford (3); *Sandalwood*—W. R. Cairns (5); *Scott's Bottom*—J. C. Blakley (0), O. Boeckers (0); *Shoal Bay*—C. Barrett (5), A. Nash (3); *Snowtown*—J. B. Kirchner (6), A. E. Dolling (5); *Stanley Flat*—T. G.

Victorsen (3), S. C. Lee (3); *Stockport*—L. E. Klaffer (0); *Strathalbyn*—F. W. Allison (4), J. W. Collett (6); *Streaky Bay*—C. H. Williams (4), W. J. Williams (4); *Tantanoola*—G. H. Bird (4), M. Telfer (5); *Tantanoola Women's*—Mrs. D. K. Edgcumbe (5), Mrs. E. C. Telfer (5); *Taplan*—J. P. Condon (2), J. Hammond (3); *Taragoro*—Thos. Winters (4), A. A. Edwards (4); *Tarlee*—D. G. Kelly (1), N. L. Clarke (3); *Tatiara*—H. G. Fisher (5), L. H. Butler (6); *Tintinara*—E. Inglis (4), W. N. Bridle (4); *Truro*—W. E. Scott (0); *Tulkineara*—F. H. Vardon (2); *Upper Wakefield*—John Cleary (4), J. C. Hartnett (3); *Virginia*—A. Hatcher (6), W. S. King (1); *Waddikee Rocks*—W. E. Hier (5), Ed. Rossiter (4); *Waikerie*—T. Thompson (2), H. E. Milner (3); *Wallala*—W. R. Baldock, jun. (4), M. R. Nottle (0); *Wandearah*—W. C. Slater (5), J. S. O'Shaughnessy (5); *Warcowie*—S. A. Sweet (5), G. T. Hilder (2); *Warramboo*—E. J. D. Oswald (4), E. Adams (5); *Warramboo Women's*—Mrs. F. Chilman (4), Mrs. C. Deed (6); *Wasleys*—E. W. Day (1), W. C. Toll (0); *Wasleys Women's*—Mrs. F. Sanders (2), Miss G. George (4); *Watervale*—G. Holder (4), W. Hamp (6); *Wauraltee*—A. W. Kelly (1), A. V. Mitchell (4); *Weavers*—J. A. Bridges (2), H. W. Cornish (3); *Wepowie*—D. M. Grogurke (4), D. Crocker (4); *Wilkawatt Women's*—Mrs. W. Neville, sen. (5), Mrs. J. Steer (5); *Williamstown*—D. P. Gordon (2), Syd. Coleman (4); *Williamstown Women's*—Mrs. G. Hammat (6), Mrs. E. Coleman (5); *Willowie*—H. T. Hughes (5), A. Crisp (6); *Wilmington*—M. Christopherson (3), Chas. Cole (5); *Windsor*—A. D. Prime (0); *Wirrabara*—H. W. Hollitt (4), Ron. Bowman (4); *Wirrilla*—R. F. Kelly (4), A. E. Scarfe (6); *Wirrilla Women's*—Mrs. R. Woods (1), Mrs. W. R. Jones (2); *Wolseley*—H. C. M. Pilgrim (4), A. Grosser (5); *Wudinna*—Wm. A. Dubois (5), C. W. Johns (5); *Wynarka*—H. Rawlins (5), M. N. Blacket (6); *Yadnarie*—F. W. Jericho (4), J. E. Quick (4); *Yaninee*—G. P. Roe (4), J. L. Roe (4); *Yantanabie*—L. N. Nield (0); *Yeelanna*—R. R. Wilson (6), Geo. Aird (5); *Yurgo*—J. Bullen (5), M. E. Walker (4); *Yurgo Women's*—Mrs. L. Hopgood (3), Mrs. H. Sanders (5).

The figure after each delegate's name indicates the number of sessions attended; 6 being the maximum.

OPENING SPEECH BY HIS EXCELLENCY SIR ISAAC A. ISAACS (GOVERNOR-GENERAL).

I very much appreciate the honor of being asked to deliver this opening address. I do so for two reasons: one is that as it is obviously impossible for me to visit every important centre of production in Australia, it is a very welcome sight indeed to me to see so many representatives of producers and earnest students in the science of agriculture gathered together. It enables me to give to you all and to those whom you represent in your home towns the message of His Majesty's constant and strong personal interest in your welfare and in the work that you are doing in developing your part of the Empire, and to tell you how delighted he always is to hear of the success and progress of his people. The other reason is that I recognise as well as you do the public importance and advantage of such a Congress as this.

Agriculture plays such a great part in our national life, even if we look upon it as confined to its own special domain, and still more when we remember how intimately it is connected with the other two branches of industry, the pastoral and the manufacturing industries, but it is very hard indeed for anyone to over-estimate its claim on our attention. Now, if this were a conference on human progress it would be very interesting indeed to start with the arresting fact recently given prominence by an eminent scientist, an Australian, by the way, Professor Elliott Smith, which I recently read. He says: "Civilisation began when man ceased to be a mere food gatherer and became a food producer—a farmer, who cultivated cereals and bred cattle." He says: "That the presence of a natural crop of barley on the banks of the Nile was, in all probability, the predisposing factor in starting that vast revolution in the affairs of mankind which led on to the creation of civilisation, because it allowed mankind to settle down in one place and give up his nomadic life; it allowed him to multiply, to commence those arts and sciences which gradually have led up to the present day culture and refinement.'' And that was somewhere about 6,000 years ago.

The astonishing fact to me is that although agriculture itself became known to mankind 60 centruies ago, yet scientific or intensive agriculture is not yet quite 100 years old. Indeed, as you know, in some of its essential features, like the production of our great wheats, it is little more than 30 years old. There are two facts which always appeal to my mind and which show the wonderful advances made in late years. The one is—and I do not know whether this has ever struck your minds or not—the old table of Troy weight we learnt at school, and the other is, for instance, Farrer's Federation wheat. Troy weight tells of 24 grains in one pennyweight. That has a history. In Saxon times, before money was coined as it is now, and milled, people used to clip a little bit off the silver penny, and if any one wanted to know whether he was tendered his full weight for his goods, the Saxons made a law that if you put the penny in one scale and put the 24 grains of wheat, dried in the ear, on the other side, that was a test whether it was a proper pennyweight. In Farrer's Federation wheat we see the triumph of scientific hybridisation. It shows the wonderful advance being made in one direction of agricultural science, and we know that it is the last 50 years in which the science of agriculture has embraced almost every activity that goes to make farming a successful avocation and the farmer a prosperous and cultured and self-reliant citizen. It does so much to convert farming from being a mere hazardous calling to being a comparatively reliable enterprise. Indeed, experiments in soils and fertilisers, in conservation of moisture, in improvements of plants, in diversification of crops, in mixed farming, in herd testing, and in farming practices generally, have transformed, and are daily transforming the whole science of agriculture. And I think that South Australia is very fortunate in having a Department of Agriculture that is alive to all of these things. And it is fortunate, too, in having a Bureau of Agriculture so constituted that we are able to focus, so to speak, at one place, as here to-night, so much energy, enthusiasm, experience, and educational fervour from all parts of this State. This Congress is not only likely to be of great value to the State of South Australia, but, indeed, to the whole Commonwealth. I hope it will be one of great success. I trust that you will all be able to look back to this Congress, not only as a step in advance in the science of agriculture, but also as a signal aid to the development of our vast and noble Empire to which we are all ready and eager to render loyal and useful service.

At the instance of Mr. A. J. Cooke, seconded by Mr. J. B. Murdoch, a hearty vote of thanks was accorded His Excellency.

ADDRESS BY THE MINISTER OF AGRICULTURE (HON. S. R. WHITFORD, M.L.C.).

This is the third occasion on which I have had the pleasure of addressing you at the opening of your Conference, and whilst we must all regret that hitherto we have met under a cloud of intense economic depression, we can take comfort from the thought that the seasons have begun to smile upon us again, and that to-day we can anticipate that, with moderately favorable spring conditions, last year's record wheat production of 48,000,000bush. should be exceeded in the current season.

In this connection I cannot help expressing my personal admiration for the plucky fight put up by primary producers during the recent difficult times. It is well known that two years ago the Commonweath as a whole found itself suddenly faced by a financial position of considerable difficulty, from which honorable extrication did not seem possible except by rapid accumulation of overseas credits. Unfortunately, towards that end there was little apart from primary products that could be exported to advantage from Australia; unfortunately, too, both current and prospective prices of these products were abnormally low; and it follows that if overseas commitments were to be met considerably increased rural production had become a national necessity; hence an urgent call for maximum rural production that circumstances permitted was issued by the Federal authorities. And loyal and thorough has been the response of South Australian producers in spite of the prospect of disastrously low prices. In 1930-31 our farmers put in a record area under wheat—4,180,000 acres—but the season proving unfavorable only a moderate yield resulted; nothing daunted, our farmers sowed only a slightly reduced area in 1931-32, and had the satisfaction of harvesting a record return of over 48,000,000bush. In 1931-32 our butter exports rose from 1,097 tons to 3,303 tons; our cheese exports from nil to 400tons; our eggs in the shell from 773,000doz. to 2,026,000doz.; our fat lambs from 20,821 to 136,000; our wines from 1,830,000galls. to 3,035,000galls., and so on. We have here a record of which our primary producers have every reason to be proud; and much is it to be regretted that unprecedently low world prices should have robbed them of the full reward of their efforts.

Let us not forget, however, that the export of much of this rural produce would not have been economically possible but for our adverse exchange rate, which has had the effect of raising local prices above world parity to the extent of 25 per cent.; had exchange been near normal, and exports curtailed accordingly, our home markets would have been completely demoralised, and the position of rural producers parlous in the extreme Hence, in the interests of primary production, and coincidently of the State and Commonwealth as a whole, it is much to be hoped that this adverse exchange rate will be maintained until such time as world prices of rural commodities shall have attained to a more normal level.

OTTAWA.

Whilst on this subject our thoughts turn naturally to the Ottawa Conference and the probable influence of its decisions on the export of our primary products. In this connection it is perhaps as well to remind ourselves that without full official details it may be dangerous to jump to hasty conclusions; and even with complete information on the subject it will be very difficut to forecast with any degree of accuracy what are likely to be the ultimate effects upon international trade of a series of trade restrictions conceived with the set purpose of confining the former to certain well defined channels. Factors influencing the flow of international trade are many and elusive; nor does it necessarily follow that they will prove altogether amenable to the pressure attempted from Ottawa. And in any case, whatever the ultimate facts, competition—the soul of trade—will continue to rule notwithstanding preferential market treatment. Other Dominions, in closer proximity to the British Isles, will be our trade rivals for corresponding goods. In the immediate past, for instance, British annual imports of wheat have averaged in the neighborhood of 194,000,000bush.; of this total, Canada—with freight charges about one-half of normal Australian charges—has supplied 62 millions, and Australia 24 millions only. Hence, it seems probable that Canada may be able to benefit from the 2s. preferential duty per quarter at the expense of the United States, with similar freight charges and normal exports to Great Britain of 52,000,000bush. per annum. Australia, on the other hand, with its prospective exportable surplus of 150,000,000bush. is not likely to displace Argentenian normal exports of 42,000,000bush., because after due allowance for British preference Argentina would still retain an advantage of 3d. a bushel from freight. I know that I have laid myself open to the accusation that I have rushed headlong into one of those hasty conclusions that I deprecated in my opening remarks, and whilst repentently admitting the fact, I can only add that none more than I will be pleased, should events prove me eventually to have been in the wrong

The fact of the matter is that, as suppliers of surplus foodstuffs, we are wrongly situated from the geographical standpoint; we are further off from the densely populated food importing countries than any of our trade rivals, and our shipping difficulties and cargo rates are correspondingly greater. Hence, we start business with a heavy economic handicap, and if, in spite of this, we wish to succeed, less than any other exporting country, can we afford to sin against the following trade canons:—

(1) Attention to quality in all products exported;
(2) Strict maintenance of uniformity in grade;
(3) Truthfulness of description; and
(4) Attractiveness of external get-up.

I am aware that I am on one of my pet hobbies now, but I know that I shall be excused for repeating myself when I state my earnest belief that strict adherence to the highest quality possible in all our exports can alone help us to overcome adequately our geographical disadvantages. I trust, too, that should at any time any of you find your exportable commodities turned down as unsuitable for export, you will realise that such measures are taken in the interests of Australian trade generally, which it is of national importance to maintain at the highest possible level. Temporary gains from the sale of inferior articles are to be deprecated, as ultimately they can have but one effect, namely, branding Australia as a country of shoddy goods, and condemning us permanently to unprofitable price values.

But if, for the sake of argument, we assume that preferential treatment on the British markets will realise our wildest imaginings—and eventually I hope that it may be so—there is one point that we should ever keep steadily before us, nor should we allow those in control of affairs of the nation to forget it, namely, that initial success is no guarantee of permanence, or even of lengthy life. There can be no permanency of trade where the advantages are all one way; permanency of trade is essentially dependent upon reciprocal advantages. We have wrung from Great Britain a series of preferences for our exportable goods in what, from press reports, appears to have been a close-fisted chaffering match, rather than the open-handed conference, which the Prime Minister of Canada is said to have anticipated. Beyond a few vague statements we are as yet without definite information as to what Australia has offered in return for preferential treatment on British markets. A general lowering of the tariff wall coupled with effective British preference appears to have been hinted at. If this be so, much will depend upon the local interpretation eventually placed upon these offers; unfortunately, the all but prohibitive tariffs at present in force may tempt us to satisfy the letter whilst avoiding the spirit of our Conference commitments. Heavy scaling down of our tariffs can alone, in my opinion, satisfy both our apparent commitments and our general requirements as a nation. The immediate effect of such a policy should be the gradual development of a steady flow of imports from Great Britain in payment for corresponding exports from Australia to Great Britain. The eventual benefits to us from this reciprocal flow of trade should be considerable; vessels required for loading our exportable commodities would no longer be forced to reach our shores on ballast, and freight rates to Great Britain would be correspondingly reduced; increased returns from Customs duties should render Federal direct taxation unnecessary; our costs of living would fall; all of which would be reflected in all round reduction in costs of rural production, and we should then find ourselves definitely in the position to compte effectively on any of the markets of the world.

If results such as these can eventually be secured from the deliberations recently held at Ottawa, we shall all agree that the Conference will not have been held in vain. It is perhaps necessary to add here that preferential access to the vast British markets, which ostensibly aims at lessening on our behalf the competition, both fair and unfair, of international trade on these same markets, does not necessarily ensure to us thereon prices better than the world parity of the day. The latter, as in all times, must continue under the governance of world wide conditions, which we trust may soon lead to progressive improvement Moreover, apart altogether from possible retaliatory measures against Great Britain or the British Empire, the attempted exclusion of foreign interests from British markets must inevitably expose us to keener competition on foreign markets which we might find it necessary to approach. Finally, I shall again stress the fact that the benefits we anticipate from the Ottawa preferences are likely to be very short-lived, unless from the outset we honestly recognise the essential mutuality of successful trade relationships, and determine to abide by our side of the bargain.

I wish next to make brief reference to the Roseworthy Agricultural College. This institution has recently had to face an extremely severe ordeal; and I feel certain that all those of you who were acquainted with its past record will have sympathised with it in its troubles. I am not, however, at present concerned with past difficulties; the Government believes that it has taken effective steps to prevent any future recurrence of them, and we shall leave the dead to bury their dead. We have placed the College under the control of a Governing Council, of which two members only are public servants; the Government appreciates very highly the public-spiritedness of those who have accepted seats on the Council, and feels confident that the future of the College can be safely left in their hands. I wish also to commend to you the new Principal—Dr. A. R. Callaghan—who has come to us from New South Wales with the highest credentials. He has already created a good impression on all those with whom he has been brought in contact, and I feel sure that in a very short time he will win back public confidence for the College.

And lastly, gentlemen, let me congratulate you all on the prospects of another favorable season. I know that the low price for wheat is still causing you anxiety. Last year the Premier and I tried hard to induce the Federal Government to impose a sales tax on flour, from the returns of which the wheat growers of Australia would have been paid a special bonus. We did not succeed, but eventually the Federal Government paid you a direct bounty of 4½d. per bushel, involving a loan of over three million sterling, interest on which has to be borne by the general taxpayer, and the principal of which will eventually have to be met from the same source. The sales tax would have entailed payment of niether interest nor principal, and in the circumstances we thought it better adapted to the existing financial position I can assure you that we have not forgotten you in the present season. If prices do not improve appreciably towards harvest time we shall take the matter up again with the Federal Government.

Mr. A. M. Dawkins moved, and Mr. P. J. Baily seconded, a vote of thanks to the Minister for his address.

ADDRESS BY THE CHAIRMAN, ADVISORY BOARD OF AGRICULTURE (Mr. H. N. WICKS).

When we met here last year we were passing through the worst period ever experienced by the majority of those present, and the outlook was such as to render much hope in the future well nigh worthless. On that occasion I stated that the best advice I was able to give was to hang on to the last, and that even the record depression would possibly give way to a record time of prosperity and plenty. It is indeed gratifying at the end of such a short period as 12 months to be able to state that there are tangible and definite indications that we have passed the critical stage, and that the turning point, if not actually with us, is indeed in sight, and I repeat here that I am of opinion that the lessons learnt during this time of trial may eventually lead us to that record term of prosperity which we are all looking forward to at this period. Let us hope that when this period does arrive we may utilise it not merely for selfish ends, but having in view those who have to follow us, and I hope the desire to make the Commonwealth a safer and saner place for those future generations will be the first desire of everyone. The great fundamental lesson which has been forced home to us, both from an individal and Commonwealth standpoint, is the fact that neither the individual nor the nation can practise the policy of earning a pound and spending 21 shillings indefinitely without having some day to face a day of reckoning, however much deferred. If we can absorb this vital truth and act upon it then the depression, if it has taught us the force of this, will not have been in vain

The encouraging reports on the wheat and wool markets inspire us with confidence for the future, and we trust that the present prices will increase still further, so that the financial stability of the State and the individual may be quickly restored. Our export trade in dairy produce and eggs has shown us that an increased production of these commodities is warranted, and, having obtained a firm footing on the overseas markets, we should strive not only to maintain it at the present extent of trade, but to continue to increase our hold on those markets which offer an illimitable scope for our produce.

Both dried and fresh fruit have continued to do their quota in helping the finances of the State, and although some of the later shipments of apples were disastrous to growers, nevertheless the average season's operations must be classed as satisfactory, and the future is certainly hopeful, possibly more so since the Ottawa Conference.

PERSONNEL OF THE BOARD.

During the year the Board lost one of the most ardent workers on behalf of the producer through the lamented death of Mr. H. S. Taylor. Mr. Taylor's sound judgment and advice have been greatly missed by his fellow Board members. Intensely interested as he was in the welfare of the River Murray settler he devoted a large portion of his time and energy to the interests of other producers throughout the State. His place has been filled by the appointment of Mr. J. B. Murdoch, whose experience in connection with the marketing of dried fruits will be of immense value to the Board in dealing with problems not only of the fruit grower, but of the farming community as a whole.

LIFE MEMBERSHIP.

As a mark of appreciation of the work done on behalf of our organisation, the Board has conferred Life Membership to 30 members during the year. This distinction, however small, is, I am sure, appreciated by the Bureau as a whole, and when it is considered that the qualification of 20 years' service is required for this distinction, we must all realise that the Bureau could not have any greater mark of appreciation of its worth than to know that so many of its members have been actively associated with its operations for such long periods

BRANCHES.

Eight Branches were added to the roll during the year ended June 30th, and the total membership of the organisation was then 8,283, with 316 Branches. The interest in Bureau work has been well maintained, and many Branches have exhibited increased activity. Encouraging reports have been given by departmental officers on meetings at which the members have shown an outstanding interest in search of information, particularly on subjects which at one time were regarded merely as sidelines, but are now being looked upon as most important revenue earning operations of a farm.

There has been a marked improvement in the work of the Women's Branches. The number of Women's Branches has now increased to 29, and when it is recalled that most of these Branches have been established voluntarily and without any organised system of advertisement, it is evident that country women are realising the many advantages which may be obtained through the services of this institution.

CONGRESS AND CONFERENCES.

The largely attended Congress of 1931 was gratifying to all concerned, and I venture to think that the meetings arranged for you this year will be the means of making Congress more popular than ever, and that delegates will return to their Branches with the conviction that there is no neglect on the part of the Agenda Committee in keeping up the standard of agricultural education which the Congress affords.

In all there have been 17 Conferences held in various parts of the State during the year. Members have shown enthusiasm by their attendance and by the valuable material they have supplied for the respective Agendas. The value of a Conference cannot be overestimated, and I strongly advise all members to continue their interest in this sphere of Bureau work. Conference districts are formed with the main object of bringing together a group of Branches having similar agricultural interests. District Conferences, therefore, provide the only means for famers to meet for the purpose of discussing agricultural practices within their own limits of soil and climatic conditions. Every opportunity should, therefore, be taken by members to attend these gatherings not only for their own personal advancement but for the general welfare of their districts.

THE WORK OF THE PAST YEAR.

Many resolutions from Conferences have been forwarded to the Board for consideration. It has been the practice to advise the Branch submitting a resolution as to the action taken by the Board. Following a discussion at the recent Southern Conference the Board has now decided that after a Conference has been held this information will be given to all Branches in the Conference district concerned instead of to an individual Branch.

The Board has also adopted a new rule in respect to voting for the place of the next Conference. In future each Branch represented at any Conference will appoint one member to act as its representative, and the voting for the place of next Conference will be confined only to those representatives. This has been practised in some districts of recent years, and it has given general satisfaction.

With refernce to the resolutions of last year's Congress it will be noted that a Parliamentary Committee has taken evidence on the question of Bulk Handling, and it is hoped to publish a resume of the Committee's findings in due course. Matters dealing with taxation were brought under the notice of the authorities, and in the case of the sales tax on farm machinery, the loss of £140,000 per annum in Federal revenue, if the tax were removed, has been a barrier to any alteration in this legislation. Motor registrations have been reviewed, and it will be seen from the Agenda that this question will be again brought up for discussion at this Congress. The Bureau protested against the tariff, and it is expected that this protest will have some effect in reducing the burden which the farmer has to bear under our protective policy. The question of the use of producer gas for driving farm tractors has been placed before the Council for Scientific and Industrial Research, and we have been informed that the lack of funds has prevented that body from making further research into this matter. We have been assured by the Controller-General of Customs that the necessity for close supervision in order to ensure that the prescribed conditions relating to the size and quality of cornsacks has been strongly brought under the notice of the Collectors of Customs in the several States.

Inquiries were made in relation to the branding of wheat bags, and it was found that the policing of the proposed legislation would necessarily involve the Government in considerable expenditure which in times like the present could not be recommended.

The request that bales of binder twine be labelled showing description, weight, etc., has been taken up with the Chamber of Commerce, and it is proposed to bring this matter up again to see if some of the difficulties that at present stand in the way can be overcome.

The Board has not lost sight of the request for the abolition of the outward wharfage on primary products, and in relation to the annual subscription of Bureau members it has been explained to Branches that owing to the financial position no alteration in the existing conditions has been recommended. You will notice, however, that this question will also be again discussed at this Congress.

In regard to the prevention of fire in country districts the Board got in touch with all Branches with a view to impressing upon them the benefits that would be obtained by joining forces with fire-fighting organisations in their work of fire prevention and control.

The resolution of Congress relating to the suggested closing of country schools no doubt had some influence on the Government in maintaining these schools as in the past.

Among the many items which have been dealt with by the Board during the year the question of the sale of butter substitutes has had the consideration of the Government, and regulations under the Food and Drugs Act will come into force on November 1st, and these regulations should have some effect in protecting the dairying industry.

The National Council of Woolselling Brokers has given an assurance that the blue stripe in woolpacks about which many complaints were received would be eliminated as far as possible.

A deputation of Board members waited on the Minister during the year in connection with the Turretfield Farm, and the Government subsequently decided to continue the operations of this Farm for the purpose of raising seedwheat. As soon as the Department is in a position to offer reliable seed it is sincerely hoped that farmers of the State will, by purchasing seed requirements from the farm, show their appreciation of the Government's action in this matter.

Representations were made to the fertiliser companies with the result that there was an announcement last season that a cash discount of 5 per cent. would be allowed on purchases of superphosphate as well as an extra 1s. per ton for deliveries made during January and February.

Attention was drawn to the danger of introducing Phylloxera through the medium of fruit carried by passengers on steamers, and action was taken by the Phylloxera Board to safeguard fruitgrowers' interests by the destruction of fruit introduced in this way.

As a result of a resolution passed at the Wudinna Conference the General Manager of the State Bank intimated that his Board was prepared to consider applications for payment of wages to applicants' sons when actually incurred and payable in connection with the provisions of the Farmers Relief Act.

The Board decided to hold a special Conference in the interests of Branches associated with the dairying industry. This was held at Mount Barker, and was regarded as one of the most successful Conferences held throughout the year. Another Conference will be held next year in the same locality.

A further successful Conference was held for settlers on the irrigated areas along the River, and it has been decided to make this an annual function.

At the instigation of Branches the Board has recommended to the Minister that steps be taken to bring into operation a scheme of certifying seed potatoes on similar lines to that adopted in Western Australia.

Other items of interest are:—

A reduction in the commission charges on sales in country markets has been secured, and the rate is now 5 per cent. instead of 10 per cent. as in the past.

The Board has given its support to the request for raising funds for the purpose of investigating the thrips pest, and finally we are indebted to the Director of Education for this compliance with out request to make the school holidays in 1933 synchronise with the September Show, so that country parents may have a better chance of visiting the Show with their children.

There are many other investigations which are in progress, and the Board will do what it can to bring them into effect for the welfare of the farming community.

In concluding my remarks I desire to refer in brief to the estimable work which Branches have done throughout the year in connection with competitions, and to the assistance which members may seek from the instructional staff of the Department of

Agriculture, and in passing we extend our heartiest congratulations to Mr. A. M. Dawkins (a member of the Board) in securing the Challenge Shield donated by the Royal Agricultural and Horticultural Society for the champion crop of the year. Most of the districts throughout the State carried on their competitions with commendable results. I take it that this is significant of the educational value in which members view this phase of Bureau work, and I am pleased to know that these and other districts are renewing their Competitions during the present season. I hardly know of any better means of ascertaining the best cultural methods for a district than these Competitions, and I feel that we should have a few thousand entries from year to year instead of a few hundred. Through the instructional staff, the Department of Agriculture is anxious to assist you not only in the matter of Crop Competitions, but in any way it is possible for them to do so. As Bureau members I wish to impress upon you that you have certain rights and privileges, and the departmental officers expect you to exercise them in order that they may carry out their duties on the one hand and further to take some part in increasing the production of your farms, as well as in regaining the general prosperity of the State.

TUESDAY, SEPTEMBER 13th.

Morning Session.

Mr. Alan H. Robin, B.V.Sc. (Government Veterinary Officer, Stock and Brands Department) read a paper on "Mammitis, Milk Fever, and Contagious Abortion in Cattle." The paper is published as a separate article in the *Journal.*

RESOLUTION.

Following a very interesting discussion in which Mr. Robin replied to many questions Congress unanimously resolved:—"That this Congress realising the importance of the dairying industry and the serious losses incurred through the ravages of mammitis requests the Stock and Brands Department to conduct field experiments to ascertain the value of the various vaccine treatments at present on the market in order to assist dairymen in their efforts to overcome this scourge."

Mr. A. J. Cooke (Vice-Chairman, Advisory Board of Agriculture) read a paper on "The Paterson Scheme," which is published elsewhere in this issue.

At a separate session an address was given by Dr. Davidson (Waite Research Institute) on "Some Economic Insect Problems of Orchard Fruits in South Australia," and papers were read by Mr. Max J. Vickers (Lenswood) on "A few Impressions of Future Trade Prospects in the East for our Fruit and Vegetables," and Mr. R. Nosworthy (Balhannah) on "Bees—Life and Culture." The former paper is published in this issue as a separate article, and Mr. Nosworthy's paper will appear in a subsequent issue.

RESOLUTION.

At the instance of Mr. C. Robertson (McLaren Flat), seconded by Mr. H. B. Richardson (Penola), it was decided that this Congress strongly stresses the importance of compiling all records at the Blackwood Experimental Orchard and put them into safe keeping.

Afternoon Session.

Mr. A. G. Barrett (Barrett Bros. Pty. Ltd., maltsters) read a paper on "Malting Barley on the Farm and in the Malt House," which is published as a separate article.

A paper on "Wheat Varieties in South Australia," prepared by Mr. R. C. Scott (Supervisor of Experimental Work) was read by Mr. W. J. Spafford (Deputy Director of Agriculture). Mr. A. Lyell McEwin also read a paper on "Methods of Improving Draught Stock Breeding." Both papers appear elsewhere in this issue.

Evening Session.

At the evening session Prof. A. J. Perkins (Director of Agriculture) read a paper on "Some Points in the Handling of a Fat Lamb Flock on a Mallee Farm," which will be printed as a separate article.

FREE PARLIAMENT.

Wednesday Morning.—September 14th.

The following resolutions were carried :—

Redhill Branch—"That the Commissioner of Railways consider reducing the railway freights with a view to increasing business."

Yurgo Branch—"That rail freight on super. be reduced 50 per cent., also pointing out that if applicant to the Farm Relief Board be allowed sufficient super. per acre, the return freight in wheat will by far exceed the loss on reduced super. freights."

Pygery Branch—"That the Railways Commissioner give special reductions in freight in cases of stud stock."

Tatiara Branch—"That the import duty (or tariff) on all materials used in the manufacture of superphosphates be removed."

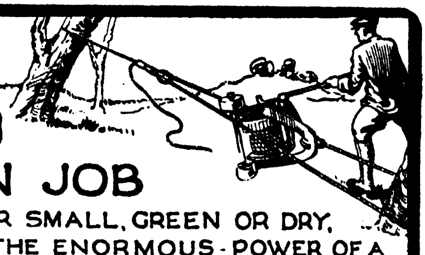
Laura Bay Branch—"That the restriction on the importation from America of Farm Journals be removed."

Port Elliot Branch.—"That Parliament be requested to amend the Motor Vehicles Act to allow more freedom to Primary Producers."

Blackwood Branch—"That districts that are not in touch with railways should not be "controlled roads."

Warramboo Branch—"That the Farmers' Relief Extension Act of 1931 be altered and a clause be inserted therein whereby the Relief Board shall have power to allow the farmer the necessary service fees for the purpose of breeding up stock to replace old and worn out ones."

Warramboo Branch—"That the Farmers' Relief Extension Act of 1931 be altered and a clause inserted therein whereby the Board shall have power to grant the farmer a percentage of the proceeds of his crop to meet necessary expenses which are not at present provided for under the Relief Act."



GRUBBING
IS A ONE MAN JOB
FOR STUMPS LARGE OR SMALL, GREEN OR DRY, SHORT OR HEAD-HIGH. THE ENORMOUS-POWER OF A
MONKEY GRUBBER
EASILY ACCOMPLISHES THE TASK
Removing the most stubborn obstacles cleanly, with most roots intact.
Easy to handle, simple to operate, expeditious—its only need, regular oiling.
The Standard equipment will clean up everything over 1½ acres from one anchorage.
Each part designed for simplicity, easy handling, and long trouble-free service.
A TIME SAVER AND PROFIT MAKER
ADELAIDE STOCKISTS—Australasian Implement Co., Colton, Palmer & Preston, Harris Scarfe Ltd., McPhersons Pty. Ltd., South Australian Farmers' Union.
TREWHELLA BROS. PTY. LTD., TRENTHAM, VIC.

Miltalie Branch.—"As superphosphate is so very essential for the production of wheat and other fodders, we consider that a reduction in price is long overdue. Manufacturers have demanded spot cash for the last two seasons which should enable them to sell at a lower price."

Belvidere Branch—"That in view of the activities of the Society for the Prevention of Cruelty to Dumb Animals a committee be formed in each district to safeguard our interests in respect to rabbits, horses, and stock generally, and suggest that in the event of action being taken in any case, evidence by two experienced farmers or teamsters be accepted."

Bundaleer Springs Branch.—"That approved veterinary surgeons be subsidised in various districts of the State."

Wallala Branch—"That the Government allow the State Bank to assist farmers to purchase approved stallions."

Clanfield Branch—"That Congress is stongly of the opinion that all lubricating oils and greases offered for sale should have the container branded with the grade and guarantee of purity of contents."

Wallala Branch—"That the Government be asked to renew the subsidy for District Crop Competitions."

Yeelanna Branch—"That some future recognition be given to competitors receiving 2nd, 3rd, and 4th positions in the State Championship of the Wheat Crop Competition."

Laura Bay Branch—"That the Crown Lands Department be approached to supply poison, and (or) make provision to destroy rabbits on Crown Lands in farming areas, District Councils or Vermin Boards to supervise same."

Maltee Branch—"That the Advisory Board of Agriculture endeavor to force all delegates to attend at least two-thirds of the Congress meetings, otherwise the delegates forfeit their fare to and from Adelaide."

Tatiara Branch—"That the old and new rule of members be abolished, as it penalises the new members, and that is the only way in which the Bureau will prosper."

Langhorne's Creek Branch—"That the Congress Agenda be sent out to Branches six weeks before Congress."

Murray Bridge Branch—"That the Government take from the Motor Transport Board all control of Primary Produce."

RESOLUTIONS LOST.

Black Springs Branch—"That this meeting of delegates urge various Governments to pay another bounty of 6d. per bushel on wheat for this coming harvest."

Greenock Branch—"That a registration fee of £1 1s. be charged-for each stallion to provide the nucleus of a fund for subsiding suitable stallions on lines similar to the subsidised dairy bulls scheme."

Clanfield Branch—"That in the interests of our primary producers Congress recommends that the Department of Agriculture publish a text book on our rural primary industries."

Pinnaroo Line Conference—"That in the opinion of this Congress the new rule *re* membership should be rescinded and that a *Journal* levy on all members be introduced and paid by each Bureau member entitling him to a copy of the *Journal.*"

Evening Session.

A paper on "The Dairying Industry" was read by Mr. H. B. Barlow (Chief Dairy Instructor) and was fully discussed by delegates. This paper will be treated as a separate article in the *Journal.*

Mr. C. F. Anderson, (Government Poultry Expert) gave an address illustrated with lantern slides, "Recent Developments in the Poultry Industry."

At the invitation of Mr. A. G. Barrett delegates visited the Lion Maltings on Wednesday afternoon, on Thursday morning they visited the Waite Research Institute, and on Friday the Government Produce Depot at Port Adelaide.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

The Eastern Division of the Murray Lands, represented by the Loxton, Paruna, Taplan, Meribah, Caliph, and Alawoona Branches of the Agricultural Bureau, met in Conference at Paruna on September 27th. Mr. A. C. Webb (Chairman of the local Branch of the Bureau) presided, and Messrs. S. Shepherd (Member of the Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Government Poultry Expert), R. L. Griffiths and P. H. Suter (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary, Agricultural Bureau) attended on behalf of the Department.

The opening address was delivered by Mr. Shepherd, and the following papers were read and discussed:—"Conservation of Fodder," Mr. H. C. Webb (Paruna); "Costs of Production," Mr. E. D. Symon (Loxton); "Value of Experimental Stations of South Australia," Mr. H. Pengilly (Alawoona); "Co-operation and the Agricultural Bureau," Mr. P. Hodge (Taplan); "Some Observations on Bureau Meetings," Mr. A. McKenzie. An excellent agenda provided good discussions, and Departmental officers replied to numerous questions. Conference carried the following resolutions:—

"That the 1933 Conference be held at Taplan."

"That the old and new rule of members be abolished, because it penalises new members."

"That the Government be asked to renew the subsidy for Crop Competitions."

"That this Conference protests against undue interference by inexperienced officers of the S.P.C.A."

The evening session was occupied with an address, "The Poultry Industry," by Mr. C. F. Anderson (Government Poultry Expert).

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow October to August.	Per Herd during August.	Per Cow during August.	Per Cow October to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ...	34	27·06	21,750½	639·72	5,784·74	1,135·73	33·40	295·86	5·22
5/D ...	31·10	29·10	22,752	731·57	5,709·39	1,193·58	38·38	303·07	5·25
5/E ...	42·58	38·45	26,287	617·35	5,100·23	1,438·28	33·78	275·68	5·47
5/L ...	19	19	16,693⅛	878·61	6,629·85	856·15	45·06	330·71	5·13
5/R ...	58·39	43·45	25,413⅛	435·24	3,794·66	1,082·39	18·54	160·89	4·26
5/S ...	22	15·39	8,548⅛	388·57	4,231·04	472·34	21·47	223·82	5·53
5/U ...	27·48	21·48	23,918⅛	870·39	8,459·56	1,036·05	37·70	364·53	4·33
5/Y ...	25·42	22·81	17,074	671·67	6,703·78	944·04	37·14	358·04	5·53
5/AA ..	16	14·71	5,680	355·00	4,161·64	303·71	18·98	224·86	5·35
5/DD ..	20·55	17·10	10,819	526·47	5,733·05	598·90	29·14	323·31	5·54
5/EE ..	18	15·90	17,347⅛	963·75	6,717·16	929·55	51·64	354·81	5·36
5/II ...	27·94	22·42	16,251	581·64	6,027·72	813·41	29·11	295·41	5·01
5/JJ ..	26·61	20·61	18,724	703·64	5,277·86	852·67	32·04	233·25	4·55
5/KK .	20	17·87	9,562	478·10	5,833·75	481·27	24·06	285·13	5·03
5/MM .	15·29	12·97	6,892	450·75	4,841·17	393·28	25·72	248·57	5·71
5/NN .	24·84	17·84	13,848	557·49	5,579·68	665·93	26·81	267·19	4·81
5/OO ..	21	12·35	9,193	437·76	5,000·46	436·78	20·80	233·58	4·75
5/PP ..	31	29	20,376	657·29	5,081·83	959·03	30·94	246·97	4·71
5/QQ ..	18	16·10	7,436	413·11	4,688·78	413·18	22·95	248·82	5·56
					Dec.-Aug.			Dec.-Aug.	
5/RR ..	22	22	12,989	590·41	3,788·78	766·11	34·82	209·94	5·90
5/SS ..	15·71	10·19	7,619¼	485·01	3,486·76	374·22	23·82	169·04	4·91
Means .	25·57	21·23	15,198·79	594·46	5,403·84	768·89	30·07	268·51	5·06

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow July to August.	Per Herd during August.	Per Cow during August.	Per Cow July to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E ...	23	14·97	10,213	444·04	951·28	421·68	18·33	39·00	4·13
7/H ...	8·58	7·58	5,482	638·93	1,268·28	285·51	33·28	64·63	5·21
7/K ...	20	19·23	17,571	878·55	1,911·63	721·66	36·08	78·03	4·11
7/L ...	33	23·74	19,642½	595·23	1,159·41	1,009·37	30·59	58·90	5·14
7/T ...	11·74	7·61	5,868	499·82	701·73	256·52	21·85	30·81	4·37
7/W ..	17·58	13·26	12,010	683·16	1,151·90	502·33	28·57	48·95	4·18
7/Y ...	21·26	17·35	11,378	535·18	1,203·27	540·30	25·41	57·26	4·75
7/Aa ..	12·90	9·13	5,482½	425·00	782·96	289·77	22·46	41·08	5·29
7/Hh .	16	11·45	6,914	432·12	785·34	309·88	19·37	35·62	4·48
7/Kk .	24·16	17·10	16,093½	666·12	1,182·09	663·87	27·48	50·39	4·13
7/Ll ..	13·39	9·94	5,969	444·18	881·32	248·99	18·54	37·11	4·21
7/Mm .	36·58	33·52	31,353½	1,072·77	1,713·79	1,171·19	32·02	65·58	3 74
7/Nn	23·10	17·55	15,665½	678·16	1,155·10	656·47	28·42	49·07	4·19
7/Oo ..	16	13·58	11,200	700·00	1,278·66	517·61	32·35	60·65	4·62
7/Pp ..	12	8·26	7,781	648·41	1,235·73	442·19	36·85	68·73	5·68
7/Qq ..	13	9·81	5,465½	420·42	918·26	322·95	24·84	53·91	5·91
7/Tt ..	16	10·84	8,040½	502·53	1,105·28	396·45	24·78	53·73	4·93
7/Uu .	22	17·58	14,619½	664·52	1,254·09	647·72	29·44	58·80	4·43
7/Vv ..	12·55	10·81	9,849½	784·81	1,374·74	509·11	40·57	73·57	5·17
7/Ww .	16	11	9,878	617·37	1,002·18	499·20	31·20	50·86	5·05
7/Xx .	15	14·26	12,297½	819·83	1,638·23	680·26	45·35	89·93	5·53
7/Yy .	13·81	9·74	5,420	392·46	716·92	240·07	17·38	32·88	4·43
7/Zz ..	19·94	14·84	6,567	329·34	600·39	264·76	13·28	24·26	4·03
Means .	18·16	14·05	11,076·57	610·07	1,167·98	504·25	27·77	53·69	4·55

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR AUGUST, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during August.	Per Cow during August.	Per Cow December to August.	Per Herd during August.	Per Cow during August.	Per Cow December to August.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ...	20	18·52	15,010	750·50	4,424·61	661·16	33·06	199·40	4·40
6/C....	21·81	20·81	20,729	950·43	5,337·48	905·31	41·51	224·02	4·37
6/F ...	26·61	23·61	25,002	939·57	5,793·29	1,236·03	46·45	284·63	4·94
6/H ...	28·77	26·87	23,517½	817·43	4,582·40	1,075·26	37·37	214·30	4·57
6/O ...	17	14·74	11,437	673·01	4,440·94	592·82	34·89	232·64	5·19
6/X ...	19	18·74	11,929½	627·87	5,501·86	479·83	25·25	233·88	4·02
6/Y ...	21·71	14·03	8,105	373·33	3,914·52	357·01	16·44	174·92	4·40
6/Ee ..	42	26·29	14,641½	348·61	3,475·94	640·88	15·26	161·69	4·38
6/Ii ...	30	16·03	9,243½	308·12	4,951·43	420·71	14·02	228·09	4·55
6/Kk .	19·26	13·52	8,205½	426·04	4,176·79	328·99	17·08	188·80	4·01
6/Ll ..	23	17	12,538½	545·15	4,698·53	491·86	21·39	194·08	3·92
6/Oo ..	16·68	11·42	10,235½	613·64	6,041·47	406·98	24·40	277·72	3·98
6/Pp ..	16·68	14·81	10,156	608·87	5,477·45	486·36	29·16	267·05	4·79
6/Qq ..	26·10	20·61	17,757	680·34	5,748·07	754·78	28·92	259·69	4·25
6/Rr ..	29·65	23·77	20,195	681·11	5,681·54	755·94	25·50	248·20	3·74
6/Tt ..	21·10	18·55	11,989½	568·22	5,321·84	504·14	23·89	247·86	4·20
6/Uu .	29	22·52	15,899	548·24	4,571·48	643·03	22·17	201·17	4·04
6/Vv ..	27	21·87	21,044	779·41	6,324·18	923·66	34·21	293·56	4·39
6/Xx .	25·71	21·35	15,229	592·34	5,272·13	667·06	25·95	233·45	4·38
6/Yy .	25·77	23·26	13,956	541·56	4,771·90	634·04	24·60	244·55	4·54
6/Zz ..	22·61	21·58	17,820	788·14	6,189·44	785·55	34·74	287·70	4·41
6/Aaa .	19·42	12·52	10,258½	530·67	3,129·32	516·63	26·76	165·57	4·95
6/A ...	18	18	12,307	683·72	—	583·07	32·39	—	4·74
Means .	23·78	19·15	14,661·11	616·00	4,917·86	645·70	27·16	226·92	4·40

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., AUGUST, 1932.

IMPORTS.

Interstate.

Apples (bushels)	63
Bananas (bushels)	10,984
Citrus—	
Grape Fruit (bushels)	5
Oranges (bushels)	6
Passion Fruit (bushels)	499
Paw Paws (bushels)	2
Pineapples (bushels)	865
Peanuts (bags)	289
Peanuts, Kernels (Bags)	27
Beans (bushels)	22
Cabbages (bags)	2
Carrots (bag)	1
Melons (bags)	2
Onions (bags)	523
Potatoes (bags)	4,217
Swedes (bags)	6

Bulbs (packages)	12
Plants (packages)	105
Seeds (packages)	58
Trees, Fruit (packages)	24
Trees, Ornamental (package)	1
Wine Casks (No.)	2,060
Fumigated—	
Plants (packages)	19
Trees, Fruit (packages)	16
Tree, Ornamental (package)	1
Wines Casks (No.)	10
Rejected—	
Potatoes (bags)	11
Secondhand Cases (No.)	10

Overseas.

(State Law.)

Wine Casks (No.)	864

Federal Quarantine Act.

	Packages.	lbs.		Packages.	lbs.
Seeds, &c.	5,637	1,067,028	Cocoanut Chests	8	—
Tea Chests	4,123	—			Super ft.
Canes	114	—	Timber	258,544	5,469,283

EXPORTS.

Federal Commerce Act.

		Packages.
England	Oranges	30
Netherlands, East Indies	Apples	100
	Oranges	201
	Pears	50
	Vegetables	25
Straits Settlements	Vegetables	6
	Potatoes	5

		Packages.
Straits Settlements	Oranges	30
Singapore	Oranges	72
	Lemons	21
	Apples	100
	Vegetables	138
New Zealand	Oranges	20
	Seeds	30

P R E S E R V A T I O N

IT IS DEFINITELY AN ECONOMY TO USE

BERGER'S PREPARED PAINTS AND VARNISHES

ON THE HOMESTEAD AND ALL FARM EQUIPMENT.

There is a product for every purpose.

Try our Special Non-corrosive Red Roofing Paint, four gallons for 46/-, F.O.R., Adelaide, or F.O.B., Port Adelaide. Warranted not injurious to water required for domestic use.

COLOUR CARDS AND ALL INFORMATION FREE.

LEWIS BERGER & SONS (AUSTRALIA) LIMITED,

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D E C O R A T I O N

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. SANDFORD & Co., LIMITED, reported on October 3rd, 1932.

BUTTER.—Production throughout the State continued to increase throughout September, and it is many years since such propitious weather for dairying has been experienced in this State. The result was that increasing supplies of cream came forward to the various factories and heavy shipments of butter went forward each week to London. The local trade was well maintained, but owing to London values having eased, rates moved back in sympathy here, and at date are:—Choicest creamery fresh butter in bulk, 1s. 2¼d.; prints and delivery extra (these prices are subject to the stabilisation levies); well conditioned store and collectors, 8d. to 9d. per lb. at store door, less usual selling charges.

EGGS.—Record quantities of eggs were handled throughout the month, but the peak of production seems now to have been reached, although warmer weather would no doubt stimulate production. Packing for export is still proceeding apace and will continue until the end of November. Unfortunately, a large proportion of the eggs arriving from country centres will not pass the graders for export, and this surplus has to be disposed of for pulping and other purposes. Ordinary country eggs, hen or duck, 5d. per dozen; selected, tested, and infertile higher.

CHEESE.—The South-Eastern factories are manufacturing very heavy quantities of this commodity, and although local and Western Australian traders purchased up to the average quantities, there was a considerable surplus for export which was shipped to London from week to week. Rates continued steady. New makes, large to loaf, 7¾d. to 8¼d.; semi-matured and matured, 10d. to 11d. per lb.

BACON.—The turnover in bacon continued at a high level throughout September, the advent of the Royal Show helping in this direction. Some interstate trade was also negotiated, Queensland and New South Wales purchasing some quantities and Tasmania also bought occasionally. Values have improved in some of the lines, and the demand has been keeping up well. Best local sides, 8½d. to 9d.; best local factory-cured middles, 8½d. to 9d.; large, 8d.; local rolls, 8½d. to 9d.; local hams (raw), 11½d. to 1s.; cooked, 1s. 2d. to 1s. 3d.; lard, prints 6d. per lb.

ALMONDS.—Only limited quantities of almonds were marketed throughout September as most of the growers have ere this sold the bulk of their supplies. Buyers therefore were unable to obtain all their requirements, and the various markets are being kept clear of stocks as they arrive. Brandis and softshells, 9½d. to 10½d.; hardshells, 6d. to 6½d.; kernels, 2s. 1d. to 2s. 2d. per lb.

HONEY.—No improvement in the demand for honey was recorded, and tinners and wholesalers are holding considerable stocks. Until an outlet is found overseas for this commodity the market is dull. Prime clear extracted, in liquid condition, 3¼d. to 3¾d.; second grade, 2d. to 2½d. per lb.

BEESWAX.—Selling steadily at quotations:—1s. to 1s. 1d. per lb.

LIVE POULTRY.—The sales of live poultry throughout the month were well attended by buyers, but the quantities submitted were not as great as in other months of the year. This, however, is usual, and with keen competition all lots met with ready quittance at satisfactory prices. We advise consigning. Crates loaned on application. Prime roosters, 3s. 8d. to 4s. 9d.; nice conditioned cockerels, 3s. 2d. to 3s. 7d.; fair conditioned cockerels, 2s. 9d. to 3s. 1d.; chickens, lower; heavy-weight hens, 3s. to 4s.; medium hens, 2s. 6d. to 2s. 11d.; light hens, 2s. to 2s. 5d.; couple of pens of weedy sorts, lower; geese, 3s. 6d. to 4s. 6d; prime young Muscovy drakes, 4s. to 5s.; Muscovy ducks, 1s. 9d. to 3s.; ordinary ducks, 1s. 8d. to 2s. 6d.; ducklings lower; turkeys, good to prime condition, 8d. to 9d. per lb. live weight; turkeys, fair condition, 6d. to 7d. per lb. live weight; turkeys, fattening sorts, lower; pigeons, 5d. to 6d. each.

POTATOES.—4s. 9d. per cwt.

ONIONS.—New season's, 42s. per cwt.

RAINFALL TABLE

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of, and to the end of September, 1932, also the average precipitation to the end of September, and the average annual rainfall.

Station.	For Sept., 1932.	To end Sept., 1932.	Av'ge to end Sept.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·38	3·56	3·46	4·75
Marree	0·94	4·81	4·26	5·93
Farina	1·17	5·05	4·94	6·48
Copley	1·24	5·81	6·20	7·95
Beltana	0·61	5·42	6·58	8·59
Blinman	1·20	7·38	9·45	12·00
Hookina	0·95	8·49	9·01	11·42
Hawker	0·96	11·22	9·76	11·42
Wilson	1·72	11·25	9·16	12·23
Gordon	1·77	8·71	8·16	10·69
Quorn	1·84	12·42	10·52	13·35
Port Augusta	1·01	10·97	7·30	9·42
Bruce	1·75	9·62	7·53	9·90
Hammond	2·08	12·71	8·74	11·33
Wilmington	2·36	15·64	14·07	17·50
Willowie	2·37	13·98	9·60	12·16
Melrose	2·64	26·20	18·57	12·16
Booleroo Centre	1·90	17·91	12·01	15·20
Port Germein	1·83	17·36	9·70	12·45
Wirrabara	2·76	23·99	15·45	19·27
Appila	2·23	17·85	11·50	14·69
Cradock	1·35	9·26	8·42	19·27
Carrieton	2·10	9·35	9·57	12·35
Johnburg	2·19	8·82	8·06	10·63
Eurelia	2·83	11·16	10·12	13·06
Orroroo	3·40	12·62	10·36	13·24
Nackara	2·09	9·88	8·84	11·16
Black Rock	2·83	11·56	9·64	12·46
Oodlawirra	3·77	12·21	8·90	11·62
Peterborough	4·17	15·24	10·13	13·24
Yongala	3·12	16·18	11·10	14·44
NORTH-EAST.				
Yunta	1·32	10·10	6·33	8·43
Waukaringa	1·22	6·57	6·21	8·00
Mannahill	0·32	4·58	6·11	8·30
Cockburn	0·74	5·67	6·05	7·91
Broken Hill, N.S.W.	0·44	5·23	7·39	9·58
LOWER NORTH.				
Port Pirie	1·74	16·88	10·39	13·19
Port Broughton	1·42	11·94	11·32	13·93
Bute	2·19	16·78	12·56	15·38
Laura	1·74	19·98	14·30	17·99
Caltowie	2·20	18·23	13·17	16·74
Jamestown	2·10	18·85	13·94	17·75
Gladstone	1·85	16·64	12·86	16·32
Crystal Brook	1·71	16·20	12·57	15·81
Georgetown	2·68	19·25	14·70	18·39
Narridy	2·23	15·34	12·72	15·89
Redhill	1·83	18·06	13·35	15·56
Spalding	2·21	17·78	14·90	19·13
Gulnare	2·29	21·03	14·76	18·62
Yacka	1·75	17·10	12·27	15·32
Koolunga	1·67	14·84	12·26	15·43
Snowtown	1·73	16·91	12·65	15·62
LOWER NORTH—*continued.*				
Brinkworth	1·89	16·88	12·62	15·74
Blyth	1·75	16·08	13·44	16·76
Clare	2·21	24·13	19·96	24·54
Mintaro	2·66	22·39	19·01	23·34
Watervale	2·37	23·55	21·88	26·91
Auburn	2·34	22·17	19·42	24·00
Hoyleton	3·31	15·62	13·77	17·33
Balaklava	1·30	13·18	12·29	15·52
Port Wakefield	1·12	11·76	10·48	12·96
Terowie	3·44	14·75	10·22	13·39
Yarcowie	3·30	15·82	10·65	13·63
Hallett	3·04	19·79	12·87	16·43
Mount Bryan	3·63	20·84	13·40	16·70
Kooringa	2·46	18·68	14·31	17·90
Farrell's Flat	2·07	18·30	15·04	18·66
WEST OF MURRAY RANGES.				
Manoora	3·47	20·38	14·94	18·82
Saddleworth	3·41	20·67	15·66	19·54
Marrabel	2·95	21·92	15·95	19·83
Riverton	3·12	20·84	16·72	20·73
Tarlee	1·37	16·24	14·40	18·09
Stockport	1·70	18·01	13·28	16·80
Hamley Bridge	2·48	17·23	13·18	16·55
Kapunda	1·65	18·66	15·81	19·81
Freeling	1·27	16·55	14·18	17·87
Greenock	2·50	18·87	17·20	21·60
Truro	1·70	17·17	16·03	20·02
Stockwell	1·70	19·15	16·02	20·15
Nuriootpa	1·95	20·85	16·57	20·62
Angaston	2·00	19·93	18·05	22·43
Tanunda	1·50	19·10	17·86	22·04
Lyndoch	1·92	20·28	19·06	23·48
Williamstown	1·86	24·99	22·87	27·63
ADELAIDE PLAINS.				
Owen	1·20	13·21	11·63	14·00
Mallala	1·35	14·54	13·30	16·59
Roseworthy	1·48	16·73	13·86	17·32
Gawler	1·34	16·02	15·29	18·99
Two Wells	1·32	14·89	12·66	15·74
Virginia	1·62	16·45	13·82	17·14
Smithfield	1·34	18·83	14·08	17·42
Salisbury	1·39	19·05	15·04	18·55
Adelaide	2·01	22·08	17·23	21·09
Glen Osmond	1·92	25·37	21·42	25·95
Magill	1·92	26·26	20·99	25·49
MOUNT LOFTY RANGES.				
Teatree Gully	1·78	24·61	22·34	27·29
Stirling West	3·48	45·86	39·14	46·78
Uraidla	2·94	49·56	36·81	43·82
Clarendon	2·26	33·14	27·27	32·80
Morphett Vale	1·85	21·51	18·61	22·59
Noarlunga	2·20	21·14	16·95	20·33
Willunga	2·26	24·31	21·73	25·13
Aldinga	2·57	20·39	16·92	22·09

RAINFALL—*continued.*

Station.	For Sept., 1932.	To end Sept., 1932.	Av'ge to end Sept.	Av'ge Annual Rainfall.
MOUNT LOFTY RANGES—*contd.*				
Myponga	3·08	30·19	24·88	28·94
Normanville	2·42	19·30	17·33	20·67
Yankalilla	2·58	21·40	19·27	22·80
Mount Pleasant	3·82	27·28	22·40	27·21
Birdwood	3·32	29·89	24·00	29·16
Gumeracha	2·87	32·02	27·51	33·36
Millbrook Rsvr.	2·56	30·75	28·55	34·95
Tweedvale	3·16	35·70	29·93	35·83
Woodside	2·32	31·30	26·73	32·23
Ambleside	2·49	32·90	28·86	34·88
Nairne	1·86	28·48	23·08	28·13
Mount Barker	3·29	40·82	26·14	31·71
Echunga	2·62	35·27	27·43	33·14
Macclesfield	2·21	27·17	25·08	30·46
Meadows	3.19	35·28	29·75	36·10
Strathalbyn	1·97	15·29	15·68	19·35
MURRAY FLATS AND VALLEY.				
Meningie	2·28	18·20	15·09	18·42
Milang	1·40	14·73	12·01	14·96
Langhorne's Crk.	1·68	15·75	11·60	14·76
Wellington	2·57	19·24	11·45	14·58
Tailem Bend	2·57	20·14	11·35	14·61
Murray Bridge	2·02	13·52	10·66	13·68
Callington	1·53	14·10	12·14	15·25
Mannum	2·13	12·88	9·13	11·51
Palmer	2·33	16·74	12·22	15·49
Sedan	1·33	10·53	9·64	12·16
Swan Reach	1·01	10·07	8·25	10·61
Blanchetown	0·91	9·46	8·56	11·08
Eudunda	2·07	18·28	13·56	17·12
Sutherlands	1·36	11·80	8·32	10·80
Morgan	0·92	8·78	6·88	9·20
Waikerie	0·83	9·07	7·34	9·69
Overland Corner	0·39	7·90	7·87	10·47
Loxton	0·54	10·95	9·08	11·64
Renmark	0·38	9·27	7·89	10·50
WEST OF SPENCER'S GULF.				
Eucla	1·06	8·42	8·15	10·04
Nullarbor	1·04	11·32	7·23	8·66
Fowler's Bay	2·41	15·49	10·11	11·70
Penong	2·24	14·34	10·28	11·84
Koonibba	1·78	14·27	9·80	11·46
Denial Bay	0·92	10·15	10·60	10·96
Ceduna	1·74	12·49	8·12	9·75
Smoky Bay	1·29	12·60	8·64	10·20
Wirrulla	2·34	12·84	8·15	9·57
Streaky Bay	2·31	16·57	12·78	14·80
Chandada	1·88	14·13	—	—
Minnipa	2·22	16·37	11·37	13·55
Kyancutta	1·60	14·94	—	—
Talia	2·55	16·13	12·32	14·56
Port Elliston	4·00	20·36	14·04	16·34
Yeelanna	2·94	20·62	13·23	15·73
Cummins	3·01	19·65	14·67	17·46
Port Lincoln	3·42	23·42	16·44	19·37
Tumby	2·98	16·50	11·04	14·00
Ungarra	3·24	17·99	13·50	16·70
Carrow	1·71	12·68	10·08	13·10
Arno Bay	1·30	15·12	9·89	12·40
WEST OF SPENCER'S GULF—*continued.*				
Rudall	1·98	16·39	9·73	12·26
Cleve	2·22	19·72	11·76	14·62
Cowell	1·23	11·04	8·76	11·14
Miltalie	2·30	16·82	10·78	13·56
Darke's Peak	2·05	18·80	12·08	14·86
Kimba	1·70	15·07	9·38	11·53
YORKE PENINSULA.				
Wallaroo	1·07	18·07	11·65	13·90
Kadina	1·64	18·59	12·90	15·63
Moonta	0·99	15·86	12·42	15·06
Paskeville	1·62	16·27	12·72	15·52
Maitland	1·31	20·61	16·51	19·91
Ardrossan	1·34	13·78	11·38	13·95
Port Victoria	1·80	16·51	12·63	15·40
Curramulka	1·93	19·38	14·66	17·88
Minlaton	1·44	18·59	14·76	17·82
Port Vincent	1·44	15·07	11·69	14·49
Brentwood	2·01	17·85	12·61	15·44
Stansbury	1·67	16·10	13·92	16·80
Warooka	2·38	16·96	14·81	17·53
Yorketown	1·69	15·81	14·13	16·93
Edithburgh	2·14	17·30	13·54	16·36
SOUTH AND SOUTH-EAST.				
Cape Borda	1·99	24·99	21·52	24·77
Kingscote	1·66	19·42	16·11	19·10
Penneshaw	1·97	19·18	15·65	18·16
Victor Harbor	2·45	24·28	17·57	21·26
Port Elliot	1·91	18.46	16·40	19·94
Goolwa	1·84	18·45	14·59	17·81
Copeville	1·37	12·47	8·73	11·42
Meribah	0·42	12·78	9·11	11·21
Alawoona	0·33	11·51	8·05	10·02
Mindarie	0·41	15·46	9·06	11·89
Sandalwood	0·88	14·82	10·50	13·59
Karoonda	1·06	15·08	11·17	14·34
Pinnaroo	0·61	13·84	11·50	14·62
Parilla	0·73	14·36	11·00	13·91
Lameroo	0·82	15.05	12·66	16·16
Parrakie	1·60	16·72	11·39	14·51
Geranium	1·39	17·56	12·98	16·44
Peake	1·12	15·45	12·73	16·21
Cooke's Plains	1·39	19·45	12·20	15·41
Coomandook	1·99	17·08	13·65	17·22
Coonalpyn	1·59	19·85	13·91	17·44
Tintinara	1·26	18·96	14·83	18·70
Keith	1·48	16·08	14·30	17·91
Bordertown	1·61	18·25	15·23	19·32
Wolseley	2·26	19·76	14·60	18·44
Frances	1·23	17·23	15·67	20·03
Naracoorte	1·47	21·17	18·09	22·62
Penola	1·86	21·15	20·91	26·14
Lucindale	2·17	24·84	18·94	23·11
Kingston	1·96	22·50	20·28	24·33
Robe	1·67	24·90	20·88	24·65
Beachport	1·79	30·34	22·97	27·01
Millicent	2·05	28·12	24·87	29·81
Kalangadoo	1·74	32·10	25·95	32·30
Mount Gambier	1·84	28·42	24·70	30·64

AGRICULTURAL BUREAU REPORTS.

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Aldinga	*	—	—
Allandale East	*	14	11
Alma	*	—	—
Amyton	*	—	—
Angaston	*	—	—
Appila	*	—	—
Appila-Yarrowie	†	7	—
Arthurton	†	—	—
Ashbourne	†	12	9
Auburn Women's	*	28	25
Balaklava	*	—	—
Balhannah	†	—	—
Balumbah	†	—	—
Barmera	374	—	—
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Berri	*	19	14
Big Swamp	*	—	—
Blackheath	*	20	17
Black Rock	*	—	—
Black Springs	*	11	8
Blackwood	†	10	14
Block E	*	—	—
Blyth	*	28	25
Booleroo Centre	*	14	11
Boolgun	*	—	—
Boor's Plains	†	6	3
Borrika	†	—	—
Bowhill	*	10	7
Brentwood	372	6	3
Brinkley	*	12	9
Brinkworth	369	10	7
Brownlow	*	—	—
Buchanan	†	—	—
Bugle	*	11	8
Bundaleer Springs	*	—	—
Bute	*	20	17
Butler	*	—	—
Calca	*	—	—
Cadell	*	—	—
Caliph	†	4	1
Caltowie	*	—	—
Canowie Belt	*	—	—
Caralue	*	12	9
Carrow	*	12	9
Chandada	†	—	—
Charra	*	—	—
Cherry Gardens	†	8	12
Clanfield	*	—	—
Clare Women's	*	—	—
Clarendon	*	10	7
Cleve	*	1	5
Cobdogla	*	—	—
Collie	*	5	2
Colton	*	—	—
Coomandook	†	27	24
Coonalpyn	*	—	—
Coonawarra	*	13	10
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	—	—
Cummins	372	14	11
Cungena	*	6	3
Currency Creek	*	17	14
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	—	—
Elbow Hill	373	11	8
Eudunda	*	3	7
Eurelia	†	8	12
Eurelia Women's	†	5	2
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Farrell's Flat	*	28	25
Finniss	*	—	—
Frances	†	—	—
Frayville	*	—	—
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Greenock	†	—	—
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Gumeracha	*	17	14
Halidon	*	—	—
Hanson	*	11	8
Hartley	†	5	9
Hawker	*	—	—
Hindmarsh Island	†	—	—
Hookina	*	—	—
Hoyleton	†	17	21
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Ironbank	*	—	—
Jamestown	*	24	R
Jervois	†	13	10
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Kalangadoo	*	8	12
Kalyan	*	19	16
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Kangarilla Women's	364	20	17
Kanmantoo	*	—	—
Kanni	*	—	—
Kapinnie	†	14	11
Kapunda	*	14	11
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Karoonda	*	12	16
Keith	*	13	10
Kelly	†	8	12
Ki Ki	*	—	—
Kilkerran	*	11	10
Kongorong	*	10	7
Koolunga	†	—	—
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Koppio	†	11	8
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Kyancutta	†	4	1
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Light's Pass	†	—	—
Lipson	*	8	12
Lone Gum and Monash	*	12	9
Lone Pine	†	10	7
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Lowbank	*	12	9
Loxton	*	14	11
Lucindale	*	—	—
Lyndoch	†	11	8
McLaren Flat	*	—	—
McLaren Flat Women's	365	6	3
Macclesfield	†	20	17
MacGillivray	*	11	8
Mallala	*	17	21
Maltee	†	13	10
Mangalo	*	—	—
Mannanarie	*	—	—
Marama	†	—	—
Meadows	*	12	9

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Milang	*	19	12	Saddleworth	*	14	11
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Millicent	*	28	25	Salisbury	*	—	—
Millicent Women's	†	—	—	Salt Creek	*	—	—
Miltalie	†	8	12	Sandalwood	†	—	—
Mindarie	*	7	4	Scott's Bottom	*	7	11
Minnipa	*	—	—	Shoal Bay	†	11	8
Modbury	*	12	9	Smoky Bay	*	—	—
Monarto South	†	—	—	Snowtown	†	14	11
Moonta	*	—	—	South Kilkerran	†	11	8
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Moorook	*	—	—	Springton	†	5	2
Morchard	†	14	11	Stanley Flat	*	17	21
Morphett Vale	*	—	—	Stirling	*	—	—
Mount Barker	†	17	21	Stockport	*	—	—
Mount Bryan	*	—	—	Strathalbyn	*	—	—
Mount Compass	†	6	3	Streaky Bay	†	28	25
Mount Gambier	†	14	11	Tailem Bend	*	20	17
Mount Hope	*	11	8	Talia	*	28	25
Mount Pleasant	†	—	—	Tantanoola	*	1	5
Mount Remarkable	*	—	—	Tantanoola Women's	366	5	2
Mount Schank	*	—	—	Taplan	†	11	8
Mudamuckla	*	8	12	Taragoro	*	13	10
Mundalla	*	—	—	Tarcowie	*	—	—
Murray Bridge	*	—	—	Tarlee	*	11	—
Murraytown	368	—	—	Tarpeena	*	—	—
Mypolonga	*	—	—	Tatiara	367	—	—
Myponga	†	20	17	Thrington	*	—	—
Myrla	*	12	9	Tintinara	*	—	—
Nantawarra	*	11	10	Truro	†	10	14
Naracoorte	*	8	12	Tulkineara	*	13	10
Narridy	*	—	—	Tweedvale	†	20	17
Narrung	*	—	—	Two Wells	*	—	—
Nelshaby	*	—	—	Ungarra	*	20	—
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North Booborowie	*	—	—	Virginia	*	—	—
Nunjikompita	*	13	10	Waddikee Rocks	*	8	12
Nunkeri	†	12	9	Waikerie	*	14	11
O'Loughlin	*	10	14	Wallala	†	12	9
Orroroo	*	—	—	Wanbi	*	26	23
Overland Corner	*	12	9	Wandearah	*	11	8
Owen	*	14	11	Warcowie	368	11	8
Palabie	†	—	—	Warcowie Women's	*	11	8
Parilla	*	25	22	Warramboo	*	11	8
Parilla Women's	366	19	16	Warramboo Women's	367	—	—
Parilla Well	*	18	14	Wasleys	†	13	10
Parilla Well Women's	366	18	29	Wasleys Women's	*	6	3
Parrakie	*	—	—	Watervale	*	17	21
Parrakie Women's	*	25	22	Wauraltee	*	11	8
Paruna	†	7	R	Weavers	372	10	14
Paskeville	†	11	8	Wepowie	*	3 & 31	—
Pata	*	7	4	White's River	*	11	8
Penneshaw	*	—	—	Whyte-Yarcowie	*	—	—
Penola	*	1	5	Wilkawatt Women's	*	—	—
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Penwortham	370	13	10	Williamstown	*	—	—
Petersville	*	11	8	Willowie	*	4	28
Petina	*	22	26	Wilmington	†	10	8
Pinbong	†	—	—	Windsor	*	—	—
Pinkawillinie	*	—	—	Wirrabara	*	—	—
Pinnaroo	*	—	—	Wirrilla	*	13	10
Pinnaroo Women's	*	7	4	Wirrilla Women's	*	6	3
Port Elliot	*	15	19	Wirrulla	*	19	16
Pygery	†	11	8	Wolseley	†	17	14
Quorn	*	—	—	Wudinna	†	—	—
Ramco	†	10	7	Wynarka	*	—	—
Rapid Bay	*	—	—	Yacka	*	—	—
Redhill	†	—	—	Yadnarie	*	11	8
Rendelsham	*	8	12	Yallunda Flat	*	—	—
Renmark	*	—	—	Yandiah	†	14	R
Rhynie	*	—	—	Yaninee	*	—	—
Richman's Creek	*	13	10	Yantanabie	*	—	—
Riverton	*	10	14	Yeelanna	*	12	9
Riverton Women's	*	—	—	Yorketown	*	—	—
Roberts and Verran	*	—	—	Younghusband	†	—	—
Rosedale	†	11	—	Yurgo	*	—	—
Roseworthy	*	—	—	Yurgo Women's	*	—	—
Rosy Pine	*	—	—				

* No report received during the month of August. † Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

WOMEN'S BRANCHES.

SESSIONS AT THE 43rd ANNUAL CONGRESS OF THE AGRICULTURAL BUREAU.

Members of the Women's Branches of the Agricultural Bureau opened their business session in Way Hall on Tuesday, September 13th. Mrs. J. Hammatt (Williamstown) was elected Chairman, and Mrs. Clifford (Penola) Hon. Secretary of the Congress.

In extending a welcome to the delegates, Mr. F. Coleman (Member of the Advisory Board) said it was being recognised that women were becoming a powerful factor in the primary producing spheres, and all that the Bureau stood for. The women outback were having a particularly hard time. It was pleasing to know that women were taking over the management of dairy herds, and it was safe to predict that their activities would assist materially in the progress and development of the country.

The following papers were read:—

POULTRY RAISING.

[By Miss L. A. McKay, Penola.]

In dealing with this subject, I write of facts brought about by several years of practical experience, by which I have succeeded in making poultry raising a profitable investment, as well as an interesting hobby.

The majority of women residing in country districts usually desire some out-of-doors hobby which may assist to vary the routine of domestic labors, and in taking up poultry raising it is possible to create a hobby of absorbing interest, as well as of profit.

Several characteristics are necessary to ensure success, the principal are perhaps "Interest," whilst "Regularity" is also an important factor. In practically all homesteads on the land, there are to be found several acres adjacent to the house that are not utilised for any particular farm activity. These oddments can be turned to account by using them as a free range for poultry.

Fowls confined require a good deal of attention, and although this idea is supported by many experts, yet it is not desirable where the attendant may have many domestic duties to attend to. Most country homes have a bevy of fowls of the ordinary "barnyard" variety. They supply eggs at odd times during the year.

In farming areas it is the custom to set aside so much grain for fowls' feed during the year, and little or no account is kept as to whether their presence is a profit or a loss to the place.

In starting a flock of fowls, a line of pure-bred stock is most necessary. The popular breeds in country districts seem to be the White Leghorn, the Black Minorca, and the Black Orpington. I have found that the values of various tested breeds vary according to climatic conditions. In the cold, damp areas, the Minorca seems to do better than either the White Leghorn or the Black Orpington.

Locally, I have found that Black Orpingtons are very susceptible to roup and ''scaly legs,'' thus necessitating much treatment. With the foundation of the flock solidly built upon good blood lines, one can experiment with cross breeding to produce a utility type.

CROSS BREEDING.

In the poultry world, at frequent intervals, new breeds are produced by expert breeders, the outcome of cross breeding. Therefore, how much more interesting for one to breed a type of fowl most suitable for their own particular line of business? I have experimented with three classes of cross breeding, and can safely recommend them as being a type most desirable as utility birds.

A pen of White Leghorn hens mated with a Barred Rock male bird produces birds of a very good type. The hens are excellent layers, and although not heavy brooders, yet make good mothers, and have sufficient of the ''heaviness'' of the Barred Rock to be quite a good type of bird for table purposes. Another class, bred from Black Orpington hens mated with an Indian Game bird, produces a fine type of utility bird. Of wonderfully robust constitution, they are an excellent class of bird for the cold, damp areas. Whilst inheriting the shape of the ''Game,'' with the accompanying characteristic of self defence against enemies, they possess the laying qualities of the Orpington, and although somewhat inclined to brood heavily, are easily dissuaded against so doing when removed from their nests. In appearance they are beautiful birds, possessing a lustrous, close plumage of a blue-black hue.

The hens are excellent mothers, being always on the defensive against the attacks of hawks and other pests. As table birds they are unsurpassed, and thus ensure a good return when sold. Cockerels of this cross attain the weight of 7lbs. and 8lbs. by the time they reach the marketing age, which is usually from five to six months, and are sure of gaining the highest price.

Yet another excellent utility type can be bred from Barred Rock hens mated with the Indian Game. In all characteristics they are similar to the Black Orpington-Game cross, with the exception of the color, which actually enhances the appearance of the bird, as the ''speckled'' or ''barred'' plumage is of very deep markings.

FEEDING.

I use a method which will probably be condemned by many as being unorthodox. Nevertheless, I have proved it profitable. Regularity is most essential. At whatever hour is most convenient in the morning to feed them, be sure that each day sees the meal being distributed at the same hour. I feed my fowls once a day, at about 8.30 each morning. To each fowl I allow approximately one handful of grain (usually wheat). A special shed, well away from the house, is used as a granary, and from there I convey the grain and scatter it over as large an area of grass land as possible. In scratching for it, the fowls not only have healthful exercise, but they find much insect life, and thus are encouraged to roam further afield. By feeding only once a day, they are not encouraged to linger around awaiting for the evening meal, as is customary with all fowls who are fed towards evening.

Several small drinking vessels, set in shady places at various points, are more satisfactory than one large one. Kerosene or petrol tins, cut lengthwise, answer the purpose. They should be scoured daily with a brush, to ensure the removal of any slimy substance which frequently adheres to the sides, if the cleansing operation is neglected. An occasional ''swilling'' with caustic soda and warm water is also advisable, as an additional precaution in cleansing. A plentiful supply of clean water is most essential, as fowls drink copiously at almost any time of the year. In the hotter weather frequent replenishing of the water must be strictly attended to.

During summer, when green feed is not always plentiful, I have found it advisable to add Epsom salts to the drinking water, usually at the rate of two packets to 2galls. of water. This acts as a tonic and materially assists the poultry during the moult. During winter and spring I frequently add ''Merval'' to the drinking water.

AILMENTS AND DISEASES.

With the coming of the earlier rains and cold, damp weather there is always the possibility of colds breaking out amongst the fowls. A neglected cold can terminate in roup, and as a safeguard, a few drops of kerosene dropped into each drinking vessel during the later autumn days usually acts as a preventive. If, however, an outbreak of colds should occur, isolate immediately the affected bird, and put in a warm, dry place. Cleanse the nostrils, and in each drop a little kerosene. Administer 5 grains aspirin (or aspro) in either a whole tablet form or by crushing to a powder and mixing with dripping. Repeat twice daily, and in a short time the bird should be cured. These simple remedies can often prevent a serious outbreak of sickness in the flock.

Another malady common to most fowls is that of becoming ''crop bound.'' That, too, can easily be prevented if taken in its early stages. Half a teaspoon of bicarbonate of soda, dissolved in warm water, and administered to the bird, followed immediately by a copious dose of olive oil (from two to six teaspoonfuls, as the case may require), usually removes the cause of the trouble.

''Scaly leg'' is another complaint common to the heavier breeds of fowls in damp climates. A mixture of equal parts of kerosene and olive oil applied to the legs and toes is very effective.

It is not desirable to be catching fowls too frequently for the purpose of treatment. I have found that by having a jar of this mixture kept close at hand to the house wherein I keep broody hens, I can apply it to any of the hens who require it. As the heavy breeds of fowls usually brood fairly frequently, they can be treated just as often as is necessary and yet not unduly disturbed.

BROODINESS.

Many people complain of having trouble with hens brooding for long periods. I have found little or no trouble in treating them for this. Have a small, well lighted shed in which to put them at the first sign of ''broodiness.'' If two ''broodies'' are not available at the same time put another fowl in. Feed and water in the house, and in from five to seven days they will be quite off the brood.

PERCHES AND HOUSING.

A large, roomy shed should be at the disposal of fowls for the purpose of roosting. If facing the east, they can get the benefit of the morning sun in the winter months and avoid the colder winds. Perches placed on sloping beams, extending from the extreme back wall to the foreground of the shed, are very satisfactory.

Limestone gravel, well set, is a clean and healthful ''flooring.'' It can be easily cleaned, and the limestone is of assistance in keeping down any vermin.

If the shed is set in a substantial wire-netted yard, the gate can be closed at night as a safeguard against foxes or other marauders. Frequent applications of lime wash in and around the walls and perches should prevent any danger of vermin.

Although obviously very unorthodox in my treatment of poultry, I have found that it is possible to have healthy, contented birds without bestowing more than half an hour upon them daily, excepting, of course, the occasional cleaning up days of the houses.

In conclusion, I would suggest to anyone who has a satisfactory flock of fowls to never breed from any but the pure bred birds, and to cross only from two pure bred breeds. Avoid most religiously the setting of eggs frequently offered by a generous friend. Their birds may appear all right, but in all probability their progenitors were purely mongrel. Keep an account of all eggs gathered and sold, and all birds sold; also keep a strict account of all food costs. It is the only way of obtaining accurate evidence, at the end of the year, whether the flock has paid or not.

USEFUL HOUSEHOLD HINTS.

[By Mrs. M. J. White, Parrakie.]

Preserving Cut Flowers.—Certain flowers, like the flag, lily, pansy, and others slough away when put into water. Cut off the end of the stems frequently. Wild flowers develop and fall quicker than garden flowers. Flowers plucked in the bud last longest; always place in water as soon as possible after being picked. When received by post in a wilted condition an immediate plunge into hot water to which has been added a little sal volatile will accomplish wonders. Flowers can be made to last the whole evening if the ends are sealed with a piece of wax.

To Prevent Rust.—Stoves, grates, or any iron may be left for months without further care by making a paste of fresh lime and water; smear thickly. When required again, brush off with a stiff brush.

To Repair Rubber Hose.—Cut out the bad part; get a piece of iron pipe three or four inches long the size of the inside of the hose, twist the hose over it until the ends meet, bind with waxed string or thin wire and it will last for years.

To Clean Tennis Balls.—Dissolve a cake of pipeclay or a quarter pound whiting in as much boiling water as it will absorb. Stir well with an ordinary tallow candle until it is about half melted; let cool. Brush the tennis balls with a stiff whisk in order to remove dirt. Take a little of the pipeclay mixture, mix with cold water to the consistency of cream, and apply to the ball with a brush or sponge.

Mice.—To keep mice away, place camphor in trunks or drawers and it will prevent mice doing any damage. Pennyroyal or mint placed on shelves will cause mice to forsake the house.

Tough Meat.—Add a tablespoonful of vinegar to the water in which tough meats or fowls are boiled; it will make them as tender as a chicken.

To Clean Casks.—Put a few pounds of unslaked lime in the barrel, add water, and cover. In about half an hour add more water and roll well. Then rinse with clean water. If not wanted, put 1lb. lime to a bucket of water and put in cellar.

Prickly Heat.—A bath of common salt or carbonate of soda is good. If very severe, a spoonful of sulphuric acid in a full bucket of water, used as a sponge bath, will give almost instant relief.

Lime Water.—1oz. fresh lime in 1 pint of water, strain and bottle.

Carron Oil.—Used for burns. To 4ozs. lime water add drop by drop 1oz. of olive oil. Stir until it forms an emulsion. Keep in a well-corked bottle and shake before using.

Clothes, Size of.—A size in a coat is an inch, in underwear 2ins., in a sock 1in., collar ½in., shirt ½in., shoes ⅛in., trousers 1in., gloves ¼in., and hats ⅛in.

Cane Seats.—To clean and tighten, sponge with lemon juice and salt, rinse with warm water, turn upside down, and leave in the sun to dry.

Cakes.—When baking, place a basin of water in the oven and the cakes will not burn. Always flour fruit before adding to cakes and puddings. Open and shut the oven door carefully when cooking sponge cakes, because a rush of cold air will make the cake drop in the centre.

Paint on Windows can be easily removed by making a strong solution of bicarbonate of soda. Wash the glass and in half an hour rub thoroughly with a dry cloth. Turpentine is also good.

SOCKS AND STOCKINGS (DEMONSTRATED).

[By Mrs. E. L. Orchard, Belalie.]

Stockings, like other clothes, possibly resulted from the desire to protect the legs from cold weather, though the very latest in stockings, according to a recent arrival from England, are made in finest of silk fish-net material, so there would not be much warmth or serviceability in them.

Stockings have been worn by civilised people for many years, but there are some in the summer time who prefer to go without the usual leg covering and wear sun-tan instead. Thirty years ago plain black cashmere for everyday wear and open work in white cotton or silk for parties, were the only stockings worn, and it is only during the last 15 or 20 years that they have become so very interesting, made in every shade to match every frock; heavy in winter, fine in summer, and sheerest for evening wear.

Many years ago all socks and stockings were made by hand, and it is only with the advent of machinery that it has been possible to make them of fine texture in silk and artificial silk. The hand-knitted ones are certainly very serviceable and quite fashionable for golf or a hike, but would it not be tragic for the present generation if we were suddenly deprived of the machine-made article?

It is not easy to repair at home fine stockings, though now that it is possible to have them mended by professionals at a small charge per inch it is not worth trying to do them at home, because unless one is an expert needlewoman the result is not satisfactory.

Ladders in silk or lisle stockings can be mended by turning the stocking inside out and machining with a very fine stitch, a little more than the length of the ladder, and when a heel has to be darned, if a tiny tuck is taken under the foot where it will not be uncomfortable in wearing, the darned heel will not show. Sometimes the suspender causes a tear or hole in the top of the stocking; if that is stitched all around and across by machine, it makes a strong mend and prevents a ladder. When a stocking shrinks in washing, the hem at the top can be cut open, hemmed again with a small turning, stretching well as it is stitched with the machine, and so give extra length.

Lisle and mercerised cotton stockings, after being darned a few times, can best be repaired by refooting. First cut the hem to make the leg longer, then cut out the worn part of the foot. From a leg that is sound cut two pieces of this shape—D—and proceed to refoot the stocking in this way. To form the heel, sew across the cut end of the stocking for about 1in. at the seam, then put in the D-shaped piece and the stocking will give another few weeks of wear. Men's cashmere socks can be made sizes smaller to fit a child in this way and are quite comfortable to wear.

Woollen hand-knitted socks can be refooted by cutting off above the most darned part, unravel a few rows, pick up stitches on needles on which the socks were knitted, and continue knitting as if making for the first time. A heel that has been worn before the toe can be replaced after the same manner, only it is the heel stitches that are unravelled, picked up and reknitted, grafting to finish, so that it will not be bulky in wear.

When stockings and socks have finished the work they were originally intended for, there are many uses to which they can be put. From black cashmere a neat pair of child's bathers, a mask for fancy dress occasions, golliwogs, caps, and dusters can be made. The bathers exhibited were made from one pair of S.W. stockings, and if O.S. are used, three legs will make a suit large enough for a child 8 to 10 years of age. The mask saves blackening the face if one wants to represent a Christy Minstrel or an aborigine, but, of course, is too hot for summer wear. One stocking makes a mask. Cut the leg for about 8in. and put in a V-shaped piece taken from further down the leg; call that the back, cut the mouth and eyes in the front, and oversew edges to keep the shape.

The golliwog is made from one cashmere stocking stuffed with clippings from a hooked rug; a cotton reel stiffens the neck, an old piece of astrakhan for hair, and a bright scrap of cotton material for the bow.

Boys' caps can be made in various shapes from two legs of stockings. If all the leg is without darns they only need to be cut down the back seam, joined together, and stitched like a "Johnny" cap or gathered at one end and a tassel attached or the end brought over to the side and fastened with a button. The polisher is made from all the darned feet and cut-off parts in the making of the other articles.

From a light-colored pair of fine woollen stockings, S.W. size, a small singlet or petticoat is made, and of course the larger the stockings the larger would be the singlet. First open the hem and then cut down the seam at back, lay it flat, and place second stocking—after being cut in the same way—on it. Use the top of the stockings for the bottom of the singlet, shape the neck and shoulders, armholes are left, and cut pieces from further down the leg to go from hem to underarms, to make the singlet wider. Tidy the seams on the inside for comfort and finish all edges with crocheted wool. Another use for woollen stockings—particularly those worn for golf—is to make a hot waterbag cover. Cut open in the same way as for the singlet, shape ½in. longer, and wider than the bag, and stitch.

White lisle or stockings of similar material can be used to patch summer-weight singlets and underpants. By opening down the back seam quite a large piece of elastic material is provided. Toecaps to wear under sheen evening stockings can be cut from sound parts of lisle hose.

There are many uses for silk stockings. They make comfortable sleeves to wear under a hug-me-tight or any woollen bedjacket if a person has sensitive skin. Cut off the feet and hem the ends tidily, and they can be pulled up over the arms and fastened with safety-pins to the shoulders of the nighty. Cut in ¾in. strips, or wider if they are very thin, and crochet into an oblong, square, or round; line with something strong to keep it firm, and you have a mat for the floor. A pretty bedroom cushion can be made in the same way. One stocking cuts from five to eight yards long, and a woollen stocking cut in a long strip would help in the making of a hooked rug. The tops opened and stitched together make a good duster, and feet and odd pieces all stuffed into one leg that is past wearing, then covered with cretonne, makes a good "sandbag" to put by doors in dusty weather.

Also, an unravelled silk stocking makes good padding for pin cushions. Old woollen socks and stockings cut down the back of the leg and opened out flat make good packing for winter rugs for the sleepout beds, and you all have possibly helped to make them for the Outback Relief. A dish mop and a floor mop can be easily made from pieces of lisle or woollen legs, the most important point being to secure the pieces very firmly to the handle.

In conclusion, I would like to emphasise the fact that it pays to buy good quality articles. Poor quality might stand one mending day, but the good ones in every variety will stand up to the wear and be of some use afterwards.

CHILDREN.

[By Miss R. Haines, Nelshaby.]

Children of to-day are the leaders of the generation to come, therefore it is the duty of parents, guardians, and teachers to study the dispositions and ambitions of the children, fitting them for the responsibility that one day will be theirs. Every child born into the world has a gift, which needs developing; it is our duty to endeavor to find for what particular calling a child is gifted. No matter how young, a child at its play often shows some sign of intelligence, which can easily be recognised and should be developed. The early years of a child's life should be filled with loving care, laughter, and sunshine. As Byron says, "A lovely being, scarcely formed or moulded, A rose with all its sweetest leaves yet folded." From infancy onwards a child needs careful attention, or otherwise bad habits may form, which are easier to prevent than cure.

When a child reaches the school-going age, and is sent to school, it is the first break in its life. The first years are spent in the home, mainly with its mother; when sent to school everything is changed. The atmosphere of the infant school is as the sunshine is to young plants, stimulating growth and enabling the life to unfold in all its beauty. To have power to create the right atmosphere the teacher must adjust her own inner life, so that a spirit of peace may prevail.

The children living in a town have a great advantage over their country cousins, by having kindergarten classes to which the children can attend. It gives them an idea as to what the school days ahead will be like. Children should be encouraged to play. "All work and no play makes Jack a dull boy." Some children are very hard to manage, needing a firm hand to bring out the best in them, whilst others need loving care and gentle handling. The main responsibility starts when a child leaves the primary school. Some are sent on for a higher education, others are kept at home. This is the time when the ambitions of the child should be studied.

Parents should if necessary sacrifice some of the pleasures of life to help their child achieve his or her life's ambition. If a child misses this opportunity in life, in some cases his life is ruined.

Ah! what would the world be to us
If the children were no more?
We should dread the desert behind us
More than the dark before.

THE USE OF KEROSENE IN THE HOME.

[By Mrs. E. P. Wall, Eurelia.]

Many housewives do not fully appreciate the uses of kerosene. Here are some ways kerosene can help the housewife. A teaspoonful or so in the copper will help whiten the clothes on washing-day. If the clothesline becomes rusted through damp weather, rub it over with a kerosene rag.

Add a cup of kerosene to the bucket of soap just before removing it from the fire; this helps to loosen the dirt in the clothes on washing-day. A dash of kerosene in the water used for washing the kitchen floor helps to brighten and disinfect the linoleum, also a nice gloss can be noticed when the floor is dry. A little kerosene on the duster will help pick up the dust more easily. If the supply of machine oil is exhausted, take a feather dipped in kerosene and just touch around the different parts; it will help to take the stiffness out and clear away any dirty oil.

When washing the head add a teaspoonful to the last rinsing water. This makes the hair bright, cleans the scalp of dandruff, and for school children destroys vermin in the hair. Moisten the knife polish with kerosene instead of water; it removes stains more easily.

A tablespoonful in a dish of warm water is an effective mixture for removing dirt and stains from the windscreen of motor cars. I have also washed the enamel of the car over with this mixture. The enamel seems to freshen up to its original color.

A small quantity of kerosene poured in an underground tank destroys mosquitoes and other insects without affecting the taste of the water.

For tar on clothes take a clean cloth, and with a pad of clean material underneath the tar, rub the spot with a little kerosene. Rub until the tar disappears.

BREAD MAKING ON THE FARM.

[By Mrs. F. Chilman, Warramboo.]

The baking of home-made bread is an art that seems to be dying out. Excepting in very isolated places, bakers' bread is available at least twice weekly, and farmers' wives are more and more giving up the habit of home baking and are buying their bread ready made. But, somehow, home-made bread has always been an institution in the country, and such an essential part of farm life that it seems all wrong for the farm home to be supplied by the baker with bread, especially in places where we have an abundance of wood for baking for only the trouble of picking it up.

As bread is a principal item of diet in every home, the making of it is a continual task, and for that reason the first essential in choosing a method from among the dozens there are is simplicity. Most of the recipes in use are too complicated and take up too much time and labor for the busy housewife, and this is the chief reason why many people give up doing it. Doubtless these elaborate systems make a beautiful loaf, but very satisfactory results can be obtained quite simply and with very little labor. As bread baking must be at least a twice weekly task, it should be the aim of anyone who undertakes the job to do it with as little labor and wear and tear as possible.

Acid bread is made very simply, but is not to be recommended for its continual use; it is not wholesome. It does not comply with the Pure Foods Act, and a baker is liable to a heavy fine for using acid in bread. Lemon yeast is a similar though better method and is fairly satisfactory, but for pure quality and wholesomeness nothing can equal bread made with hop yeast. Hops give the bread a fine flavor and texture that nothing else can.

YEAST RECIPES.

There are various ways of making hop yeast, but it is not at all necessary for it to be boiled; the hops only need to be scalded and soaked. The best plan is to keep a jug, or similar receptacle, for the purpose, and in this place a good pinch of hops, and add ½ pint or slightly more of boiling water. This can be set aside for any number of days, and all that needs to be done when wanted is to strain and add 3 tablespoonfuls each of flour and sugar, pour into a seasoned bottle, and in hot weather the yeast will be sufficiently worked in three or four hours to set the bread with; a longer time, say eight or ten hours, is necessary in cold weather.

The yeast need not be corked—only covered to keep out dust and flies. Refill the hop jug ready for the next batch. Potato water is always valuable for bread making, and should never be thrown away. Some needs to be added with the yeast when mixing the dough. In cold weather it is an improvement to put some in the yeast, but in summer this has a tendency to over-rise. Potato water that has been stored in the yeast bottle for a day or two has a wonderful effect if added to the bread when mixing, and if potatoes are boiled on other than baking days the water should still be saved.

The setting of a sponge some hours before mixing is considered a very important step by some bread makers, but in my opinion is only so much useless work and waste of time. Properly worked yeast, with potato water, can always be relied on to raise the bread within a reasonable time.

Correct mixing of the dough is a matter that needs some care, for a good deal of success depends on having it the right consistency, and very thoroughly kneaded, but with a little practice this is not at all difficult. The patent bread-mixers which are on the market at prices ranging from 25s. to 35s., according to size, can be confidently recommended as a complete success. One great advantage with them is that the men folk of the home will very willingly mix the bread by turning a handle, whereas the average man heartily dislikes putting his hands in the dough under any circumstances.

If making bread for show purposes, or for any special occasion, the addition of alum or cream of tartar makes it white and fine, but is not a good practice for continual use.

FAULTS AND FAILURES.

As a summary, we will take the principal faults or reasons for failure in breadmaking. When the bread is a dark color the cause may be inferior flour, or too much hops in the yeast. When it is streaky, or has hard dry lumps, it has not been sufficiently kneaded. Heavy bread is usually a cold weather complaint, and might be caused by the dough becoming chilled or not being left long enough to rise, or the yeast might not have been active enough. Warming the flour in the oven before mixing helps considerably in extremely cold weather. If the loaves are put in the oven before they are ready, they are apt to be holey and coarse; if the dough has been mixed too slack and wet, the result is much the same. Doughy bread, and bread with too much crust, are both faults that can be easily corrected by a proper manipulation of the oven; but the greatest calamity of all is sour bread. This usually occurs in very hot or thundery weather. Sometimes the fault is in the yeast, and a slight sourness can be checked by putting a pinch of baking soda in the bottle; but usually the only thing to do is to scrub the bottle out and start again; but more often bread is sour through having been left too long before baking and being over-risen.

Practice, foresight, and common sense are the greatest needs in the making of good bread, but the ability to make a good wholesome loaf is an achievement that is well worth the effort of striving for.

HINTS ON DAIRYING.

[By Miss E. Paddick, Kangarilla.]

In buying a cow there are three points to be observed, viz., large outstanding eyes, a bushy tail, and a square udder. A heifer should be about one year and eight months old before coming into milk. Kindness and gentleness go a long way in treating a cow, either old or young. Regular hours for milking are most important, and as much as possible the same person should milk the same cows. The cows should be well fed and sheltered from cold and wind.

In the preparation of dairy produce cleanliness is most essential. The separator should be washed and dried after every milking, and buckets, pans, &c., should be kept expressly for that use. Cream should be churned every other day; good butter cannot be made from stale cream. Butter should be handled as little as possible, especially in summer. One cannot be too particular with the handling of cream and butter.

FIRST AID.

[By Miss A. M. Laurie, Nelshaby.]

How often at the time of an accident do we hear people say, "If only the doctor were here," or "if I knew what to do?" while they should be saying, "Will somebody call the doctor, please, while I attend to the patient?"

No one rendering first aid should take upon himself or herself the duties and responsibilities of a doctor, but much good can often be done, and perhaps the patient saved from a great deal of suffering.

It must always be remembered that two or more injuries may result from one accident, and discretion must be used as to the sending for a doctor or taking the patient to him. Do not move the patient more than is absolutely necessary, and never remove clothing unless necessary. If clothing is being removed, always remove from the uninjured side first. Never try to remove a sock without cutting it, and if necessary with a coat, slit the seam of the sleeve of the injured side, and a shirt should be slit down the side and removed as a coat. Trousers should always be slit down the outer seam.

A first aid cabinet should be kept in every home, out of the way of children, but when accidents occur out of doors—especially in the country—materials often have to be improvised. This can be done, in the case of splint with a walking-stick, piece of wood, broom or brush handle, rifle, or better than nothing is a folded coat or paper. Bandages may be improvised by handkerchiefs, belts, or pieces of calico or linen. String or cord can sometimes be used.

Esmarck's triangular bandages are made by cutting a piece of material 40in. square, diagonally, into two pieces. This triangular bandage can be folded and used for almost any purpose, and one should be kept in every first aid box. Reef knots should always be used, as they do not slip and can easily be untied.

BROKEN BONES.

When a bone breaks a fracture is said to occur. This can be caused by direct or indirect violence and muscular action.

1. Direct violence, from a severe blow, a bullet, or crush of a wheel. The bone breaks where the force is applied.
2. Indirect violence, when the bone breaks at some distance from where the force is applied; for instance, falling on the hand and breaking the collarbone or radius, landing on the feet and breaking a bone in the leg.
3. Muscular action.—The kneecap and arm bone are occasionally broken by a violent contraction of the muscles attached to them.

Fractures are divided into simple, compound, and complicated. It is said to be:—

Simple, when the bone is broken, but with slight injuries to the surrounding parts.

Compound, when the bone is broken, and in addition the skin and tissues are torn, thus allowing disease germs to enter. This is often the case with a bullet wound.

Complicated, when the bone is broken, and in addition there is an injury to some internal organs, perhaps the spinal cord, lung, &c., or to some important blood vessel or nerve.

Also, a fracture may be compound or complicated, when the immediate result of the injury, originally simple, has been converted by careless movement of the patient.

Special varieties of fractures may be classified according to the injury to the bone itself; such as greenstick, in children, owing to the softer state of their bones; the bone may bend, and even crack, without breaking across. Impacted, when the bone breaks and the ends are driven one into the other.

General signs of fracture are pain at or near the fracture, motion of the part, crackling sensation of moving broken ends, alteration in shape, and often shortening. If the bone is close to the skin the fracture may be felt, and if compound it may be seen. Shortening is caused by the muscles contracting and so causing the bone ends to override. Bony grating may be felt or heard when the broken ends move one upon the other. This should only be sought by a doctor. Also some of these signs are absent in greenstick and impacted. Marks on the clothing or shin should be noted, as they may serve to locate the fracture.

TREATMENT OF FRACTURES.

Place the part in natural position, and keep it so with bandages and padded splints. If a leg be broken, after applying the splints tie the injured and the sound leg together at the ankle and knee and gently place the patient on a piece of board or shutter, but never remove patient until the whole leg is supported. More injury is often done after the accident than by the accident itself, especially in the case of the thigh.

If the lower jaw is broken, bandage the lower to the upper jaw with a handkerchief. For the collarbone, place pad in armpit, bandage elbow to side, sling the forearm. If the thigh is broken, apply a long splint from the armpit to outside of the heel, and a short one from the fork of the leg to the knee on the inside, and bandage. For the leg, apply splints inside and out and bandage. No attempt must be made to move a patient suffering from a fractured spine, except in a recumbent position, preferably on a stretcher. Should haemorrhage occur it must be attended to first.

DISLOCATIONS.

A dislocation is the displacement of one or more bones at a joint. The injury is accompanied by discoloration, swelling, and pain of a severe character at or near the joint. The injured part becomes deformed and fixed so that neither patient nor others can move it, and all parts below the joint become numb.

Support the limb in whatever position gives most comfort to the patient, and when taken inside, remove all clothing from around the injured part. Apply cold dressings—ice or very cold water. When necessary to give comfort, apply warmth—flannels or towels wrung out of hot water. The most common joints for dislocation to take place are the shoulder, fingers, or lower jaw.

SPRAINS.

When by a sudden twist the ligaments and parts around a joint are torn and stretched, the joint is said to be sprained. Going over on the ankle is a common example. The general signs of a sprain are the inability to use the joint, pain, swelling, and discoloration. If a sprain can be plunged into cold water immediately after the accident, it may prevent swelling, but hot or warm applications are necessary to remove it. Place the limb in a comfortable position, usually well raised, and apply hot fomentations with cotton wool and bandaging for some days. To bandage, begin at the instep and cross in front of the ankle, carrying it firmly around the ankle and tying. When the accident occurs the usual thing, of course, is just bandage it as firmly as possible. Wet the bandage if possible to make it tighter.

BRUISES.

Bruises may be caused from a blow, and this causes haemorrhage below the skin without breaking it. If a bruise can be treated at once, apply cold water, and keep the part at perfect rest; otherwise apply relays of hot fomentations, still keeping the part at rest. Later apply warmth and very gentle friction, with cotton wool, and bandage.

All of these injuries are the result of an accident of some type or another, and all require perfect rest. A day's absolute rest at the time of the accident is worth a month's afterward, therefore never neglect.

HINTS ON MAKING CAKE-BATTER.

[By MRS. H. ALTSCHWAGER, Millicent.]

There are three ways of adding eggs to cake-batter:—

1. The eggs can be broken into a bowl and stirred into the other ingredients without being previously beaten; that makes a rich cake, and one that will keep fresh better than when other methods are used, but the eggs will not help much in making the cake rise.

2. The eggs can be beaten, yolks and whites together, before they are added to the batter; a cake thus made will be lighter and less rich than that made after the first method, but it will not keep so well.

3. The yolks and whites can be beaten separately, the yolks added at the usual time, and the whites folded into the batter the last thing before it goes into the pan. The cake made in this way will be the lightest, but it will become dry sooner than either of the others.

There are also three ways of adding butter:—

1. The butter can be worked into the flour with the hand, until it is so thoroughly incorporated that its presence would be unsuspected by anyone. Many of the fine French cakes are made in that way. It gives an even although not the finest grain.

2. The butter can be melted and added to the batter the last thing, or just before the beaten whites of the eggs. That is the quickest way, but the grain of the cake may be uneven—a mixture of coarse and fine. In adopting this plan remember that the less you stir your batter before you add your butter and the more you stir it afterwards the tenderer your cake will be, for the gluten of the flour when much "worked" in the absence of shortening is likely to grow tough.

3. The butter can be creamed until it has the color and consistency of whipped cream; the sugar can be added, then the eggs next, and then the dry ingredients alternately with the milk or other wetting, until the batter is of the right thickness. That is the slowest and most difficult method, but it gives the finest grain.

Lastly, there are three ways of adding the fruit, the difficulty about which is that it has a tendency to sink in the batter.

1. The fruit can be well stirred; in fact, crushed into the creamed butter, before the sugar is added. By thus incorporating it with the butter its tendency to sink is reduced. This method produces a darker cake—but that is not always a disadvantage.

2. The fruit can be floured, and added the last thing to the batter. The flour increases the friction, and thus tends to prevent the fruit from sinking. But the novice must beware of using too much flour, or she will find uncooked patches in the cake.

3. The fruit can be heated, then added to the batter. The density of the fruit decreases as it swells, and also when the fruit is hot it coagulates a certain amount of batter that forms a coating round it. Thus in two ways friction is increased and the tendency of the fruit to sink is lessened.

If nuts or chocolate are used in making a cake, the amount of butter must be proportionally decreased, otherwise the cake will be so rich that it will fall. For example, if you use 1 cupful of butter to 3 of flour, which is the maximum, and wish to add a cupful of nutmeats or of grated chocolate, you should deduct a quarter of a cupful of butter for every cupful of nutmeats or chocolate that is added, for both ingredients are rich in fat. Nuts also require an additional amount of salt—a quarter of a teaspoonful for each cupful of nuts to develop the flavor. The added touch of salt makes all the difference between an excellent nut cake and a poor insipid one.

Cakes that contain a great deal of fruit and spices or nuts develop a fine flavor as they are kept; a nut cake is not at its best for a week after baking, and a cake with a lot of fruit and spices until it is a month old.

If you pack a cake fresh from the oven in brown sugar it will keep fresh for two months or even more, or ice the cake while hot and put it into the cake-box with a couple of green apples cut in halves.

On Tuesday morning Dr. Ethel Hillier spoke on "The Aims and Objects of the Home School." Mr. A. J. Quarrell gave a talk on "Gardens and Gardening."

On Tuesday afternoon Mrs. C. E. Dolling gave a travel talk, "New Zealand." A visit was made to the Farmers' Co-operative Union's establishment, at Mile End, where Mr. A. J. Cooke (Vice-Chairman of the Advisory Board of Agriculture) addressed and demonstrated to the visitors on the grading, packing, and marketing of eggs for local trade and export to London, supplemented by a demonstration on cream grading and butter making. Cars to convey delegates from the Way Hall and back to the city were generously provided by the management of the factory.

Under the guidance of Dr. Fenner and Miss Campbell, delegates on Wednesday morning visited the Unley Central School, and in the afternoon Miss E. Campbell, Dip. Dom. Econ., gave an address and demonstration, "Wool and its Uses," and Miss Armitage a demonstration of wool spinning.

The following resolution was carried:—That "First aid and how a child should act in the case of clothing catching on fire" be taught in public schools and also brought before all Branches of the Bureau.

For delegates' attendances see page 328, report of Annual Congress.

BELALIE (Average annual rainfall, 17.75in.).

July 12th.—Present: 27 members.

Reading as a Recreation for Women.—Miss Carter, B.A., read the following paper: Books are a big factor in a cultured life. Reading is educative in the highest degree, for books represent the accumulated wisdom of the ages, and we absorb ideas while quite unaware that the process is going on.

As there is no end to the making of books, so there is no end to the kinds of books offered to readers. Philosophy, History, Biography, scientific treatises; all attract a wide circle of readers, but the book meant when we consider reading as a recreation for women, is the novel. The novel as such is of fairly recent date. It was not until the 18th century that it first appeared with a social and domestic background and people in a familiar setting; though history, both of our own land and of Israel, as found in the Bible, is full of men and women, whose doings are of as great interest to us as any hero or heroine's created out of the imagination of an author, and I can recommend the Old Testament to anyone who is looking for interesting reading. It is a strange convention that has decreed that the most interesting book in the world and the one we hold in most veneration should be read on stated occasions only, and any further reading of it should be looked upon as a parade of virtue.

Everybody is interested in other people and it is this curiosity which gives us our interest in books. We read to see how the people in the story will meet the different situations in their careers. The author creates men and women who live and move in their own world and act as real people subject to the conditions and times in which they live. A character in a historical novel will be true to the period; a 17th century character will be different in many ways from a 20th century man but only in externals; the great fundamentals of loyalty, honor, and love do not change with the years.

We are all familiar with D. K. Broster's period novels, Baroness Orczy's "Scarlet Pimpernel" series which give an excellent idea of the Revolution Period, and many of Sir W. Scott's novels which reconstruct a by-gone age, and which bring to life many characters who would otherwise be mere names to us, but whatever the time in which they are to live, the author must make his men and women real to us—they must stand upon their own feet. If they do not they will be mere puppets, moving only as we see the strings pulled and they will fail to hold us.

No writer has given us more characters whom we think of, not as in the pages of a book, but as men and women who live, than has Dickens. Many readers complain that they cannot read the books. His canvas certainly is crowned, but with real living creatures, whose story, told with wonderful humour and great pathos and sympathy, will well

1932 CALENDAR 1932

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● FULL MOON.

repay the efforts put forth by the reader. This quality of being alive, of fidelity to life, is what marks a good book from the rest of the great numbers of books put forth each year. It is unreasonable to complain when we go to a library for our books that so many are poor in quality. Not every flower that grows is a champion, so we must not complain, when we choose books by the newness of the covers, if we are often disappointed. But time weeds them out, and the worth-while ones remain immortal. You are all familiar with the names of some of these immortals—Little Nell, Mr. Pickwick, Sam Weller, Tess of the D'Urbervilles, Jane Eyre, Dr. Jekyll and Mr. Hyde, Lorna Doone—to name only a few, but here perhaps more than anywhere familiarity breeds contempt, or at least indifference. We are all so familiar with their names that we do not trouble to become familiar with the people themselves to our own great loss, for here our prejudice deprives us of a great deal of enjoyment. The question of what we should read can be answered in many ways, according to our temperament, our aspirations; or perhaps according to our opportunities, for our choice is restricted—especially now that books are so expensive—to our ability to buy or to borrow from our friends or from the local library. For the majority, of course, the novel has a wide appeal. The proper study of mankind is man, and in the novel we see men and women living, loving, succeeding, or failing in their appointed tasks. In real life we seldom see the whole of the story—the separate incidents make no complete pattern—but in the novel the whole plot is before our eyes making a whole we can follow with added interest as the character unfolds and develops to the end. In every story there must be a plot, however slight, and here novels vary considerably, from the long story with its pages crowded with men and women—though many of these are not intricately woven—to many of the slight affairs turned out by the dozen. Many, while purporting to reveal life and hold a mirror up to Nature, do so in such a way as to give us a distorted picture of life. Even apart from the extreme cases, it is marvellous how little critical we are; behavior and incidents we would condemn most harshly in real life amuse us or are tolerated between the covers of a book, whereas we would be scandalised if they occurred in local life. The most intricate plots are not always the most successful stories. Take for example the mystery story. If well written we follow it with breathless interest. As the mystery deepens we pick up first one trail and then another, only to find ourselves more deeply intrigued till we reach the final solution. Then having solved it, we are finished with it. The jig-saw puzzle is complete and we search for something else to read. Nevertheless such books have their place—they beguile many a tedious hour. Edgar Wallace was a master hand at this kind of writing. He poured out his books at an amazing rate. His special power lay in his ability to create a new world in which we eagerly followed his heroes, forgetting while doing so our troubles and trials, and surely a man who can do this is entitled to his place in the stars. The books, however, which live, and to which we can turn again and again, are novels of character rather than of plot. The people are friends to whom we can go, always there whenever we come to visit them. There is something satisfying in turning the pages of a book one has enjoyed; comparable to visiting again those friends who are always the same. The very sight of the books is comforting. No one can fail to appreciate its value from a recreative standpoint. We all have a few such books that we can turn to. One big advantage of these friends is that they are always the same—whenever we find time to turn to them. A few minutes in which we can forget our troubles will send us back to them refreshed. Even the anticipation of a few minutes spell is of value in speeding up the work and making us forget the drudgery, so that work becomes a means to an end and not the end itself. I have found by experience that a book that appeals to one reader fails to interest the next. I often think that it is because they are led to expect too much, or perhaps from a desire natural to frail humanity—to appear superior, by criticising the other's choice. ("I can't understand what she can see in him—or it, &c.") There are, of course, a great number of capable writers of the present day, if we want our reading to be up-to-date; Warwick Deeping, Rose MacCaulay, Philip Gibbs, John Buchan, Clemence Dane, John Galsworthy, A. S. M. Hutchinson, &c., &c. I cannot conclude without some references to the why of books. E. V. Lucas, a very fine writer, is decidedly of the opinion that novels are for recreation, and must not set out to teach; but though the lesson may not be obvious, it is there. The writer tells us what he thinks of life. He sets out to expose pretence. How we all enjoy a laugh with Wodehouse, and how many of us realise that we are really laughing at smugness or inanity, or the over-serious golfer or the weakness of society at which he tilts for our edification. The author too sets out to praise integrity and endurance, to set out the nobility of manhood, and of generosity, and to reveal weaknesses, and if we read with understanding we cannot fail to see some lesson which is there for all to read. Our individual experience is limited in most cases, we have not the advantage of travel with its broadening influences, of meeting new people and of brushing shoulders with the giants of the day, but there are few of us who cannot meet these people in their books. Our acquaintanceship can be a big one—the writers who reveal themselves in their works, and their characters. The sayings and doings of a host of friends are there to enrich our lives. We can be transported at will to all lands far more cheaply and more comfortably than Cook's can do it, and as Shakespeare says, "Not one stomach shall be offended," a truly comforting assurance to all bad travellers. The genius of the author can create a new world in which we can live with, can even be, the hero or heroine, as we desire, we can forget ourselves and all the trials and pinpricks if we have any, and find we are carried from this time and place to other lands and ages; and then come back to realise there is a familiarity about our own home and people that endears them to us, for it is "familiarity that maketh a blessing dear." The worn rug, the familiar kettle singing on the hob, the dear ones dependent on us, mean more to each one than the manly hero or the beautiful heroine. If we are sensible we realise that though it is very nice to go on these jaunts, it is nicer still to come home, specially if we have gained an idea or two for making our own homes happier. If our reading will do this for us, if it will help us to see the romance of everyday life, it will perform a very big service, and be of immense value to us as a pastime. (Secretary, Mrs. H. Cummings.)

August 9th.—Present: 29 members.

CAKE RECIPES.—The following recipes are those of cakes which were exhibited at the August meeting:—*Nut Cakes with Dates* (Mrs. Hawke): 1 cup butter, ½ cup sugar, 1 egg, 1½ cups flour (heaped), ½ teaspoon each of ground cinnamon and bicarbonate of soda, 1 tablespoon boiling water, ¾ cup chopped dates, ¾ cup nuts. Dissolve soda in boiling water, add dates and nuts last; bake like small rock cakes in a moderate oven. *Coffee Sponge* (Mrs. W. Symonds): 3ozs. butter, 4ozs. sugar, 3 eggs, ½lb. self-rising flour, 2 tablespoons coffee essence, ½ cup milk. *Walnut Loaf*: 3ozs. butter, 3ozs. sugar, ¼ cup milk, 1 cup self-raising flour, 1 egg, ½ cup walnuts; bake in a greased loaf tin about 15 minutes. When cooked spread with chocolate icing, sprinkle with coconut and decorate top with walnuts. *Peaches* (Miss P. Moore): 2 eggs, ½ cup sugar, 2ozs. butter, 1 tablespoonful orange juice, 1 tablespoon milk, 1 cup self-raising flour; bake in gem scone trays. Cut tops off level and use cream filling. Paint lightly with cochineal and roll in castor sugar. *Milk Sponge* (Mrs. Parrington): 3 eggs, 1 cup sugar, 3 tablespoons butter, 1½ cups self-raising flour, 3 tablespoons milk; cream the butter and sugar; add the eggs, which have been beaten separately for five minutes; add sifted flour and milk. Bake in sandwich tins for 15 minutes in moderate oven. *Sandwich Filling* (Mrs. Orchard): ½ cup sultanas, ½ cup cold lamb, ½ cup almond kernels, put through mincer; add ½ teaspoon salt, and make a spreading consistency with a cooked mayonaise. *Chester Cakes* (Mrs. F. Cummings): Crumble stale cakes into a basin (if plain add a few currants and lemon peel), add a little melted butter and mixed spice, then mix to a soft consistency with milk. Roll out some rough puff pastry; spread the mixture on half and cover with the remainder of the pastry; mark into squares and bake in a quick oven. When cold ice with thin icing and sprinkle with cocoanut or brush over with white of egg and sprinkle with sugar before baking. *Cocoanut Macaroons* (Mrs. White): Whites of 2 eggs beaten well, add one cup sugar and beat again, then add 2 tablespoons desiccated cocoanut; drop on to a tray and bake in a very slow oven. *Kitchener Buns* (Mrs. Haskard): 1lb. flour, 2 tablespoons butter, 2 tablespoons sugar, 3 eggs, 2 tablespoons yeast; beat eggs and sugar; melt butter and add enough milk to mix to a dough. Set in a warm place overnight. Beat down and form into buns; let rise again for 1 hour. Fry in deep boiling fat. *Banana Tartlets* (Mrs. Brookes): 3 bananas, 1 orange, sugar; line patty pans with short pastry. Peel and mash the bananas with a fork, squeeze orange juice over them and sprinkle with sugar to taste. Fill patties with this mixture and bake in a fairly quick oven. Sprinkle with pink sugar. *Date Loaf* (Mrs. Bayly): 1½ cups sugar, 2 eggs, pinch salt, 1 cup walnuts, 2 teaspoons carbonate soda, 1 tablespoon melted butter, 2¾ cups plain flour, 2 cups chopped dates, 1½ cups boiling water; place chopped dates in a basin and pour boiling water over and allow to stand; cream butter and sugar, add eggs, flour, soda, and salt, then the walnuts, and lastly dates and water. Bake 1 hour in slow oven. *Jellied Marmalade* (Miss Mitchell): 3 poorman's oranges and 9 sweet—about 4lbs.—cut finely, and to every lb. add 3 pints water. Stand all night, boil till tender; weigh again and allow 1½lbs. sugar to every lb. Boil (galloping) for about 40 minutes or 1 hour, until it jellies. *Brownies* (Mrs. Moore): 2½lbs. flour, 1¼lbs. golden syrup, ½lb. sugar, ¼lb. lard, ¼lb. butter; melt butter, lard, and golden syrup; add sugar and 2 eggs, well beaten; add flour, in which mix 1 teaspoon ground cloves, 1½ teaspoons ammonia, 2 teaspoons carbonate soda; roll out ¼in. thick, put on slide, brush with beaten egg and put almonds at even intervals (about 2in. apart). Bake in a moderate oven; while hot cut into squares. *Lemon Cake* (Mrs. Richardson): 2 eggs, 2 tablespoons butter, ½ cup sugar, few drops of essence lemon. Beat butter and sugar to a cream; add eggs, one at a time, beating well; add essence and lemon peel; add 1½ cups self-raising flour. Bake in slow oven. Decorate with chocolate icing and walnuts or butter icing and raspberry jam. (Secretary, Mrs. F. Cummings.)

GLADSTONE (Average annual rainfall, 16.82in.).

July 8th.—Present: 20 members.

The meeting took the form of exchanging chosen recipes. *Lentil Soup* (*Mrs. H. Alvey*).—3½ pints cold water, ½ cup lentils, ½ cup haricot beans, 2 potatoes, 2 onions, little chopped parsley, pepper and salt to taste, ½ pint milk, 1 tablespoon butter. Wash beans and lentils well and soak overnight, boil slowly 3 hours or more, adding parsley, milk, and butter 10 minutes before taking up. *Anchovy Paste* (*Mrs. W. Thomas*). —Three red herrings, ½lb. butter, little cayenne pepper; mince herrings through mincer two or three times, then mix butter and pepper all well together and cork tightly. *Raspberry Pudding* (*Mrs. Gravestock*).—1½ cups flour, rub in ¼ cup dripping, ½ cup sugar, 2 tablespoons raspberry jam, mixed well with ½ cup milk, adding 1 teaspoon carb. soda. Steam two hours. *Preserved Ginger* (*Mrs. A. E. Pinch*).—Take any number of small oranges, choose thin skin and all about the same size. Grate them to make porous, put them in rainwater for three days, changing water twice a day. Take out, pull out stem end, and boil two hours in last water. Prepare syrup, weigh oranges, put little more than half weight in sugar, and little more than ½ pint neat to each ½lb. sugar. Re-boil few minutes and strain, and put in oranges and boil two hours until a nice yellow jelly is formed. *Eggless Cake* (*Mrs. S. Gillis*).—Two cups sugar, 2 cups water, 2 tablespoons butter, lemon peel, 1lb. fruit (either currants, sultanas, or dates), boil for five minutes, let cool, and add 4 large cups S.R. flour with 1 teaspoon C. soda, cinnamon, and allspice. Bake one hour. *Sponge* (*Mrs. F. Diener*).—Beat 4 eggs a little, add ¾ cup sugar, beat until you can print figure 8 with whisk, add 1 cup plain flour (sifted twice), and essence. Mix ½ teaspoon soda and C. tartar and add last, cook 10 minutes in moderate oven. *Pork and Beans* (*Miss Stephenson*).—1lb. haricot beans, ½lb. fresh pork, ½ cup tomato sauce, salt. Soak beans 24 hours and boil quickly 20 minutes with little soda and just covered with water. Cut up pork into small discs. Put beans into dish and the pork on top, add sauce and salt, cook slowly two hours and serve with buttered toast. *Method to Make Steak Tender* (*Miss Stephenson*).—Rub olive oil either side of steak and hang, then roll in greaseproof or brown paper to take oil out; steak is ready for use. *Eggless Pudding* (*Mrs. G. Smallacombe*). —Butter size of an egg, 1 cup sugar, 2 cups boiling water, 2 cups plain flour, 1 teaspoon carbonate soda, fruit to taste, steam three hours. *Spiced Steak* (*Mrs. H. Alvey*). —1lb. beef steak, ½ spoon each salt, sugar, ¼ teaspoon pepper, ½ tablespoon each of vinegar and tomato. Cut steak into disc, sprinkle flour over, add other ingredients, and blend well. Bake slowly one and a half hours. *Puff Paste* (*Mrs. Diener*).—1 cup plain flour, make hole in centre and put in yolk of egg and juice of ½ lemon and ¾ cup of water. Do not have mixture stiff, and roll out twice. *Nut Loaf* (*Miss M. J. Sargent*). —Mix together 1 cup self-raising flour, 2ozs. brown sugar, 2ozs. white sugar, add 5 chopped walnuts, 12 dates, cut up small, then 1 beaten egg, ½ teaspoon carbonate soda dissolved in enough milk to make a stiff paste. Bake in tall coffee tins for three-quarters of an hour in fairly hot oven. *Shrewsberry Biscuits* (*Miss M. J. Sargent*).—½lb. flour, 4ozs. sugar, 4ozs. butter, 1 egg, flavoring or 1 teaspoon lemon juice, cream butter and sugar, add egg and 1 tablespoon flour, then add remainder of flour gradually. Mix with hands, roll into little balls, and dip in sugar. Place on greased slide and press flat with prongs of fork, both ways. Bake 15 minutes. (Secretary, Miss M. Sargent.)

KALANGADOO (Average annual rainfall, 32.30in.).

July 9th.—Present: eight members.

QUESTION BOX.—Would the addition of lard to tallow have a detrimental effect on soap?—Answer: Members thought it would have a tendency to make the soap soft. Why is nutbread holey in the centre?—Answer: It was thought that the rising was at fault. What is the cause of bread sticking to the tin?—Answer: Because the bread dough is put in too wet; the dough should be well floured as well as the warmed tin. What is the cause of hard, white spots on sheep liver, and is the liver wholesome?—Answer: The liver is the most susceptible to all complaints, and if the sheep is not healthy it shows first on the liver, and is not wholesome. How to remove iron rust from linen?—Answer: Apply salt and juice of lemon to the spot; more than one application may be required. How to refoot socks that have not been knitted?—Mrs. Messenger gave a description of the shape required for refooting. What will remove olive oil marks?—Answer: Mrs. Brooks suggested starch made into a paste with cold water and left until dry then brushed off; probably more than one application would be required. (Secretary, Mrs. E. Dowdell.)

KANGARILLA.

July 21st.—Present: seven members.

HOUSEHOLD HINTS.—The Hon. Secretary (Mrs. M. Steer) read the following short paper:—If a sprinkle of icing sugar is mixed in the flour it will make scones very light.

When making Lamington cakes, instead of the usual icing, try jelly set to the consistency of honey, then roll in cocoanut in the usual way. When stewing prunes, add a large tablespoonful of honey instead of sugar. Add a tablespoonful of peanut butter to any biscuit recipe; this gives a nice nutty flavor. In recipes where sugar is used—particularly in puddings—try using half the quantity of sugar and a tablespoonful of honey. The flavor is delicious, and is more economical than all sugar. If unbleached calico is to be whitened do not put it into bluewater. Save all paper bags; it is easier and quicker to put an article into a bag than to make a parcel of it. The pulp of an orange gives a delicious flavor to stewed apples. The peel and pips of an orange or lemon contain tonic properties. Soak in cold water overnight and drink the liquid in the morning before breakfast.

McLAREN FLAT.

July 7th.—Present: 16 members.

Members contributed recipes and samples of small cakes. *Cakes.—Dreams.*—3 eggs, their weight in sugar, butter, cornflour, 2 teaspoonfuls baking powder; bake in pattypans for seven minutes in quick oven. Also makes nice loaf cake. *Orange Cakes.*—3 eggs, their weight in self-raising flour, weight of 2 eggs in sugar and butter, grated rind and juice of small orange, few drops of essence lemon. *Method.*—Cream butter and sugar, add well-beaten eggs, then flour, juice, and rind. Put teaspoonful of mixture in each patty, bake in moderate oven till golden brown; when cold take piece out of each cake, fill with whipped cream with squeeze of orange juice, sifted icing sugar to decorate. *Cocoanut Cakes.*—2 eggs, 3 tablespoonfuls sugar, 2 tablespoonfuls butter, 3 tablespoonfuls cocoanut, 6 tablespoonfuls self-raising flour. *Method.*—Beat sugar and eggs, then butter, cocoanut, and flour; bake in moderate oven 10 to 15 minutes. *Lamingtons.*—½ cup butter, 1 cup sugar, 2 cups self-raising flour, 3 eggs, little flavoring. *Method.*—Cream butter and sugar, add eggs well beaten, then sifted flour; bake in moderate oven. When cold cut into small squares, dip in chocolate icing, then sprinkle cocoanut all over. *Betty Cakes.*—3ozs. butter, 3ozs. sugar, 6ozs. self-raising flour, 1 egg, 4 tablespoonfuls milk, 1oz. currants. *Queen Cakes.*—¼lb. butter, 1 cup sugar, 1½ cups self-raising flour, 2 eggs, flavor with essence lemon. *Margaret Cakes.*—¼lb. butter, ½ cup sugar, 2 eggs, 1 tablespoonful milk, juice and rind orange, 1½ cups self-raising flour, ½ cup cornflour. *Method.*—Cream butter and sugar, add beaten eggs, add flour alternately with juice and milk. Put in small containers, bake in moderate oven 10 to 15 minutes. When cold brush over with apricot jam and sprinkle with cocoanut.

COOKERY HINTS (by Mrs. B. Elliot).—In making pastry for roly-poly it is better to add 1 cup of breadcrumbs to 1 cup flour, instead of making paste all flour. Gingerbread, and cakes with treacle or honey, are liable to burn easily, and so require a moderate heat. To keep cheese from moulding or from becoming dry, wrap it in a cloth, damp with vinegar, and keep in a covered dish. When making boiled puddings of any kind try putting a piece of greased paper over the top before the cloth is put on. This renders the cloth much easier to wash, and keeps the pudding nice and firm. To serve green vegetables really green, cook without lid on saucepan. Too rapid boiling spoils and makes most vegetables tough. Put a few grains of rice into salt shakers to keep salt dry; the rice absorbs the moisture from the salt. To stone raisins, put them into a warm stove on paper, leave door of store open; when raisins get warm, squeeze out the stones. To cut new bread, first dip the knife into boiling water; repeat when cool. To cover jams, &c., use soft tissue paper dipped in milk; put it over the jam at once, when the heat will dry it, making it like parchment. Put about the size of an egg of breadcrumbs tied in muslin with the cabbages when cooking. Cabbages cooked like this may be used in any way. The bread absorbs the bitter juices, also absorbs almost all smell while cabbage is cooking. Cakes will be much lighter if mixed with the hands than if a spoon or knife is used. Icing for cake may be prevented from cracking when cutting by adding 1 tablespoonful of sweet cream to each unbeaten egg. Save stale bread scraps, dry them thoroughly in an open stove, and then crush with a rolling-pin as fine as powder. These will always be at hand for preparing cutlets and fish.

Economy Hints.—A pinch of carbonate of soda added when stewing fruit saves sugar. For dried fruit, soak overnight with enough cold water to cover fruit, add a little soda; this makes the fruit a more natural color. With mashed potatoes use hot milk, and butter will not be needed. When frying fat is past use for cooking purposes, convert it into soap, or collect and sell to soapmakers. Save all scraps of soap, tie in a muslin bag, put into boiling water for a short time, then plunge into cold water. This will cause the soap to harden again in one piece. Enamelware will not readily crack or chip if it is put in a large pan of cold water, brought slowly to the boil, boiled for 15 minutes, and allowed to cool in the water before using. Glassware treated in the same way is less likely to crack.

Household Hints.—Cut flowers may be kept fresh by putting a spoonful of powdered charcoal into the vessel. Do not change water. To remove grease from a stove, try this plan:—Dip a cloth in dry soot, and rub this well over the greasy parts, then apply blacklead and the spots will at once disappear. Newspaper can also be used to remove grease spots, using it before the polish. *To Remove Match marks.*—Rub with piece of cut lemon, and afterwards with a rag dipped in water, and the stains will disappear. When filling a kerosene lamp, drop a dessertspoonful of salt into lamp; it makes the lamp burn much brighter.

PARILLA (Average annual rainfall, 13.91in.).

June 16th.

Cake Making Competition.—The following are the awards in the very successful cake making competition organised by the Branch:—Collection of sponges: First, Miss Phillis; second, Mrs. Dabinett. Sultana, currant, seed, and coffee cakes: First, Mrs. Neindorf; second, Mrs. Foale. Napoleon, gingerbread, ribbon, and Dolly Varden cakes: First, Miss Phillis; second, Mrs. F. Kerley. Collection of small cakes: First, Mrs. R. C. Kerley; second, Miss Phillis. Scones and coffee rolls: First, Mrs. Niendorf; second, Mrs. Colwill. Nut bread: First, Mrs. H. G. Johnston; second, Miss Phillis. Cream puffs: First, Miss Colwill; second, Mrs. Brown. Four varieties of pastry: First, Miss Phillis; second, Miss Colwill. Bread and bread rolls: First, Mrs. Welden; second, Miss Phillis. Yeast cake and buns: First, Miss Phillis; second, Mrs. Welden. Collection of biscuits: First, Mrs. R. C. Kerley; second, Miss Colwill. (Secretary, Mrs. R. Welden.)

PARILLA WELL (Average annual rainfall, 14.04in.).

June 21st.—Present: 21 members and five visitors.

The meeting took the form of a Cake Exhibition, and in some sections there were quite a number of entries. A small entry fee was charged, part of the proceeds being set aside for prizes. Mesdames Young & Hawthorne adjudicated. Those gaining prizes were as follows:—Dark Fruit Cake—1st Mrs. Beckman, 2nd Mrs. Holmes; Sultana Cake—1st Mrs. Holmes, 2nd Mrs. N. Venning; Coffee Cake—1st Mrs. M. Davis, 2nd Mrs. R. Billing; Light Sponge Cake—1st Mrs. B. Pahl, 2nd Mrs. M. Davis; Ribbon Cake—1st Mrs. Gent; Brown Sponge—1st Mrs. Beckman, 2nd Miss J. Blacksell; Swiss Roll—1st Mrs. Blacksell; Small Cakes (6 varieties, 3 of each)—1st Miss E. Pahl, 2nd Miss V. Ireland; Nut or Fruit Loaf—1st Miss B. Johnston, 2nd Mrs. Gent; Plain Scones—1st Mrs. N. Venning; 2nd Miss Blacksell; Best Collection of Pastries—1st Mrs. Holmes, 2nd Mrs. Slater; Cream Puffs—1st Mrs. B. Pahl, 2nd Miss B. Johnston; Biscuits (6 varieties, 3 of each)—1st Mrs. Gent, 2nd Mrs. Wurfel. An invitation was extended to the men's Bureau, and a dainty supper was handed round. (Secretary, Mrs. S. Flint.)

PENOLA (Average annual rainfall, 26.14in.).

July 6th.—Present: 18 members.

Question Box.—How to pot butter?—The best time to pot butter is in spring. Mix equal quantities of salt, sugar, and saltpetre. Mix together and roll out very fine; squeeze out all surplus water, and mix 1oz. of the mixture to every pound of butter. How to make butter soft in winter?—Wash butter in warm water, and add small quantity of hot water to the cream before churning. Why is pastry hard when cooked? —This is often due to the oven not being sufficiently hot, and also by adding too much liquid. Pastry is made lighter by adding a little lemon juice, or by adding the beaten yolk of an egg. Bake in a very hot oven. Why do cakes have a coarse appearance and have holes in when cooked?—Too much rising has been used. Sponges especially need little rising. Should cold or boiling water be used for cooking beetroot?—Putting the beetroot into cold water was said to be the general method used, but some members thought boiling water and long cooking were essential for preserving both coloring and flavor. How to make a dark chocolate sponge?—Add a little caramel to the cocoa —only very little. Bourneville cocoa has been found excellent to give dark coloring. Why do mustard pickles shrink after being pasted down for some time?—The remedy is to press pickles well down, and add plenty of liquid, so that there is a depth of liquid above the pickles. Best method of straining jelly?—Some members use flannel, tea towel, and others cheesecloth. (Secretary, Mrs. E. Kidman.)

TANTANOOLA.

August 3rd.—Present: 16 members.

Making Foot Stools.—Mrs. Edgecumbe read the following paper:—"Procure any kind of tins, but for each floor cushion it is necessary to have all tins of exactly the same kind. To make a nice size cushion it takes seven 2lb. treacle tins; another nice shape is with nine honey, health saline, coffee, or any small size tins. The following material is required. Scraps of different material, or, if required, the one piece cardboard and wadding for padding. The centre tin can be covered with any old piece of rag, but it must be covered. Place the tins together for the desired shape; then proceed as follows: Cover each tin with material such as cretonne or velvet. Place all together and sew across the tops of the tins to connect them together. Turn upside down and do the same with the bottom. When covering the tins, leave about 1in. top and bottom longer than the tin, to turn over and sew. Place on a piece of cardboard and draw around the tins. Get two pieces of cardboard—one each for top and bottom. Cover these with material and sew one on the bottom of the tins. Place padding on top of tins and sew the other cover on top. Having completed this, sew some cord around the tins on the top.'' (Secretary, Mrs. E. Telfer.)

WARRAMBOO.

June 17th.—Present: six members.

Bacon Curing.—Mrs. F. Chilman read the following paper:—The making of really first-class bacon first depends on having the right class of pig to kill. The Large White is recognised as being the very best—having a long side and fine-textured meat without coarseness—but a long-shaped pig is always better for bacon than a short, thickset one. Correct feeding, too, is most important. Provided a large quantity of feed is available it is an easy matter to load a pig with fat, but as most people prefer streaky bacon the pig should be fed to develop lean as well as fat. A fair amount of milk in the ration is the best means to this end; where milk is not available meat meal should be given. As to size the best bacon is made from pigs weighing from 120lbs. to 150lbs., and if reasonably well fed a pig should dress that weight at from 20 to 24 weeks. The bacon of a larger and older pig is more cumbersome to handle as well as being tough and fibrous, and the fat is more greasy. The pig should not have either feed or water for at least 24 hours before killing, and the weather is all important. Pork is far more susceptible to thunder or warmth than any other meat, and bacon prepared in very wet weather is seldom a success however cold. In cutting up a pig—especially a fairly small one—it is best to leave practically all the side meat on the bacon, leaving the ribs bare. The hams should be trimmed to a nice shape, and the top or hip bone removed. This leaves the next bone with a knob on the end of it. Saw this bone off about 2in. below the knob, then push the steel into the remainder to squeeze out the marrow. This is a very necessary precaution because the marrow inside the bone is where the taint or decay begins, and this method does not spoil the appearance of the ham, as does removing the whole bone. I prefer dry salting for pork rather than brine, and to 7lbs. of salt allow two cups sugar, and a full tablespoon of saltpetre. The saltpetre gives the meat a nice color and helps to preserve it, but too much makes it hard and indigestible. A large fly-proof box with a wire gauze cover makes an ideal receptacle for curing, but it is very necessary for the liquid that the salt drains out to be able to leak away. The meat should be turned and re-salted every second or third day, and at the end of a fortnight—slightly more or less according to the size of the pig—it should be cured, and the bacon ready to roll. Bacon, unless very large, should always be rolled. It is well worth the extra trouble; it holds its flavor and prevents drying out. To prepare for rolling, the bacon is laid out on the table and very thoroughly dried on both sides with a soft cloth; any moisture is likely to cause mould inside the roll. If a spiced bacon is liked, almost any kind of spices, whole or ground, may be added at this stage, by being sprinkled over the flesh side before rolling. Crushed cloves and nutmeg give a very nice flavor that penetrates all through the flesh, or ordinary mixed spice may be used; this is entirely a matter of individual taste. The actual rolling is a task that calls for a good deal of strength, because the more closely and firmly it is rolled, the better, always commencing from the thickest side. Binder twine is the best for tying—it grips better than string, and the tying is not so hard on the hands; the ties need to be about 2in. apart. The bacon is then ready to hang up, and may be used at once, but is much improved by hanging for two or three weeks to mature. (Secretary, Mrs. A. Collins.)

SOUTH-EASTERN.

TATIARA (Average annual rainfall, 19.39in.).

Question Box.—The June meeting was arranged as a Question Box night, and proved to be popular with members and provided excellent entertainment and not a little instruction. There was a good muster of members in attendance and Mr. H. Fisher presided. After formal business Mr. F. Meier gave a demonstration with weights and other apparatus of tractive resistance in relation to horse swings. The demonstration was the outcome of a contention at the previous meeting of the Branch on the question whether heavy swings had an advantage over light ones. Mr. Meier held that, once the swing was suspended its weight was negligible, and that heavy swings exerted a tractive influence upon the implement being drawn. Mr. H. Bond opposed this theory and contended that the heavier the swing the greater the load to be drawn by the team. It was to prove his theory and strengthen the case for heavy swings that Mr. Meier gave the demonstration, for which he received the thanks of the meeting. The first question drawn from the box was: "Has Subterranean clover been a success in this district?"—Mr. R. Hunt said that on light land it was a success, but on limestone and black clay lands it was a failure. Mr. H. Bond considered it was not a great success in this district; natural clovers had proved superior on most local holdings. "Should a farmer in this district send his wool to Melbourne or Adelaide?"—Mr. H. Exton pointed out that returns were always earlier from Melbourne; Mr. R. Hunt favored Adelaide because freight to that market was cheaper. "Is the Corriedale-Merino cross an improvement on the pure Merino?"—Mr. F. Milne preferred pure breeds. Mr. Bond considered that the Corriedale was a better sheep for fattening than the Merino; it also grew bulky, though light fleeces of good quality; Corriedale-Merino lambs, under 12 months old, dressed up to 74lbs. weight. "Do you think the tractor has been a good investment for agricultural purposes?"—Mr. E. Grosser did not think it had; Mr. R. Hunt favored the tractor, but considered that the ideal thing was a tractor and a good team of horses. "Can pig-raising be made profitable in this district at present?"—Mr. E. Fisher was emphatic that at present market rates it could not; rail freights were prohibitive. This opinion was endorsed by Mr. F. Densley, who cited the case of a local man who had recently sent six good porkers to the Adelaide market and, after deducting feeding costs and freight he cleared 1s. on the lot. Mr. E. Grosser said that 120lb. pigs were worth as much as heavier pigs at Murray Bridge sales. "What do you think is the best quantity of feed to give a horse?"—Mr. Densley believed that a horse should be given feed according to its appetite—as much as it will eat. Mr. F. Milne preferred quality of feed, before unlimited quantity of coarse feed. Mr. A. Milne considered that feeding should be regulated. The general opinion of members was that each feed should be eaten before another was given; more oats should be used in the feed. "What is the best method of treating a paddock sown with oats for hay, that at present is very cloddy, and on which neither combine nor harrows are effective?"—Rolling was the suggested treatment. (Secretary, L. Butler.)

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WARCOWIE (Average annual rainfall, 11.42in.).

July 6th.—Present: 14 members.

FALLOWING.—The following paper was read by Mr. R. Jarvis:—"Fallowing is one of the essentials in making wheat growing a success. It should be started as soon after seeding as possible, when the ground is wet, because early fallow generally grows the best crop, especially if one has the time to work it over in spring or soon after harvest. Rough fallow should be harrowed before seeding, otherwise some of the grain will be buried too deeply. The mouldboard plough is the best implement for fallowing. Nothing is gained by fallowing with a combine or spring tooth cultivator, because these implements will not kill all the large weeds. The soil should be ploughed from 2½in. to 3in. deep. New ground requires deeper ploughing because it is more uneven, and the low patches are likely to be missed with the implements."

DESTRUCTION OF RABBITS.—"The best time to deal with rabbits is in summer, when the feed is dry," said Mr. H. Sanders, in a paper on this subject. "They are then looking for food that contains moisture, and will readily take moist pollard mixed with poisons. At this time of the year the fumigator also will give better results. The poison cart is also useful, and the best time to lay the baits is just after a rain. A good bait for rabbits is a head of wheat dipped in strychnine. Grind the strychnine to a fine powder, make a slack paste of pollard and water and mix the strychnine well into it. Dip the heads into this mixture and place them along the edge of a wheat crop where the rabbits are troublesome. Trapping is another good method, but it is too slow. One week in summer with a good fumigator is worth a month's trapping in winter. Chaff and sulphur will kill the rabbits in their warrens. When trapping pick in all the holes, then after a few days set the traps at the holes that have been opened. I prefer the box trap because it can be covered easily and quickly." (Secretary, A. Crossman.)

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

MURRAYTOWN.

June 18th.—Present: 11 members.

SHEEP AS A SIDELINE.—Mr. W. Joppich, in the course of a paper on this subject, considered that on a 640-acre farm there should be 150 to 250 sheep carried, of which 60 per cent. should be breeding ewes. One hundred and fifty sheep with wool at 8d.

a pound should return £45 per year for wool, or 15s. a week. He preferred to go through the sheep at shearing time and mouth every sheep. Any with broken mouths should be marked for rations or market. In the discussion which followed Mr. Tregenza said it was difficult to keep the fallows clean without sheep. He thought more sheep necessary than the number mentioned. He asked Mr. Joppich as to whether it was not better to use rams of English breeds for rearing of lambs. Mr. Joppich replied that where plenty of feed was available it was a good idea to produce cross-bred lambs, but they had the drawback of producing coarse wool. Mr. Clogg thought the suggested numbers of sheep about right for the size farm spoken of, though at times there might be feed available for double the number of sheep. Mr. Joppich was asked if he thought it advisable to brand sheep twice a year. This was not considered necessary for big sheep, but it might be advisable for lambs where there was a tendency for the brand to disappear in the spreading of the wool. Mr. Joppich preferred to brand sheep on the rump. Mr. Borgas said that the owner of a registered brand could use any figure from 2 to 9 on any part of the sheep. He preferred to brand on the shoulders; this was easier to see when running the sheep through a race. Mr. Joppich asked members what they preferred to use as a dressing against fly troubles. Mr. N. Scholz said a good mixture was half kerosene and half Stockholm tar.

At a further meeting held on July 16th the Hon. Secretary read a report of the work of the Branch during the past year.

On June 21st Mr. C. A. Goddard, of the School of Mines, gave an address, "Wool Classing." (Secretary, E. Pitman.)

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BRINKWORTH (Average annual rainfall, 15.74in.).
June 13th.—Present: Nine members.

How to Farm Successfully.—Mr. H. Ottens read the following paper:—"This is a problem affecting every farmer at the present time. Owing to the collapse of the world's markets, and adverse climatic conditions experienced during recent years, fully 50 per cent. of the State's farmers are faced with this problem, without any apparent solution. It is frequently stated that the only hope lies in mixed farming, but all livestock necessary for this method are being sold at values far too high relative to returns which may be expected, and it is difficult to see how that will improve the situation. It must be realised that the farm requires the whole of your attention, both physically and mentally. Sport and pleasure must for the present be set aside, and should on no account be allowed to interfere with farming activities. Every farmer should be constantly on the alert for any way in which any operation can be carried out at less expense or improved on, and every avenue explored for any leakage and promptly remedied. Purchase of new machinery should be avoided; that old machine can be repaired with a few pounds' worth of spare parts, a little time and patience, or, if other machinery is essential, shrewd second-hand buying is the better business proposition. When working machinery, an observant eye should be kept for missing bolts, &c., and these must be immediately replaced; this will eventually save both time and expense. The old adage, "A stitch in time saves nine," is as true to-day as when it was first used. If working horses, remember that they are only capable of doing a given amount of work a day; if pushed beyond this limit a reaction will soon set in, and one will not accomplish any more, and, in addition, the team will be worn out. Generally speaking, a tractor farmer has to exercise more care and forethought than the horse farmer, and if this is not used to the fullest extent calamity will surely occur. A very important factor in successful farming is to have a plant commensurate with the amount of work to be performed. If the plant is too small, losses will result through unseasonable tillage; if too large, overhead expenses will be too high. A special warning is needed against working both tractor and horses, unless the holding is of sufficient size to warrant doing so. Every farmer should keep in touch with the latest scientific developments, and for this purpose should be a member of the Agricultural Bureau, because through this medium he can be kept in touch with the latest scientific developments. However, the most important point towards being a successful farmer is, before purchasing anything, either land, machinery, or livestock, to obtain reliable information concerning same, and after deliberately weighing all evidence, fix a price which is considered a sound business proposition, and, if below prices ruling at the time, refrain from purchasing. The sooner it is realised that the present method of arriving at values per medium of recent sales is absolutely erroneous the better for the farming community generally. Finally, by looking a few years ahead and shrewdly anticipating stock prices, every farmer could save a large amount of money—present purchasers of horses will realise this—and it is evident during this period that the advantages of the seller over the buyer are considerable." (Secretary, H. E. Ottens.)

CURRANT GROWING IN THE CLARE DISTRICT.

The following paper was read by Mr. W. H. Penna, of the Penwortham Branch, at a meeting held on June 15th:—

"The growing and treatment of currants in the non-irrigated areas has not been given that care and attention which should enable growers to obtain full production from the vines.

The last few years have not been very encouraging to growers; prices have been below cost of production, with the result that many growers have had to explore other channels, and, in doing so, have not been able to give sufficient time and labor to their vineyards. In such cases, the ultimate result will be weak and immature wood, the condition of such being the deciding factor in a heavy or light crop.

The currant industry is one of the main assets of the Clare district. At the present time there are under currants 1,475 acres, the highest tonnage produced being 1,120 tons. Last year 630 tons were produced, averaging about £25 per ton, giving to the district £15,750. This year the tonnage will be about the same, but prices have improved considerably, and should average about £10 per ton more, the district therefore benefitting by an additional £6,300. This industry also has to its credit the fact that it is one of very few primary industries that has not been assisted by the Government. During the period of stress through which it has passed its battles have been fought and won through its own organisation, with the result that to-day it is recognised as the best organised primary industry in Australia.

There are many factors to deal with which influence the quality of the dried produce, one of the most essential being pruning. Pruning stands unique in the execution of its work by the adoption of so many different ideas and systems applied. Firstly, a good sharp pair of secateurs is essential for clean and neat cutting. Observe each vine, and note whether it has made strong or weak growth, and prune accordingly. In pruning a strong growing vine, do not overtax its strength by leaving too much wood, the result being spoilt fruiting wood the following year. Always try and keep the spurs as near the main arm as possible in order to be near the main flow of sap. As to the length of spurs, two clear eyes and the base bud are advised. In selecting the spur it is essential to take into consideration its condition. If the first shoot next to the base is strong and healthy, always spur it for fruit. If this shoot is not strong enough for fruitbearing, and the top one is strong and vigorous, make this the fruiting spur, but do not overlook the fact that it will be a considerable distance from the main arm. Overcome this by leaving a reducer as far down the spur as possible to come back to the following year. Very often strong water shoots come out from the main arm, and, if in a good position to take the place of an old spur, do not fail to make a reducer of same. Always cut reducers to one eye, but the following year do not leave both the reducer and the old spur for fruit. Many light crops and small bunches are due to poor selection of fruiting wood. It is asking the impossible to expect a weak, immature spur to produce good quality fruit. Some will say that at times one has to sacrifice some of the crop to keep back the spurs, but quality is essential, and it can only be obtained from strong, healthy spurs. Have the spurs as near the top of the main arm as possible, or, if on the side, have them evenly distributed on both sides, so that when the foliage and fruit are on the vine it will be evenly balanced, not allowing the trellis to lean one way more than the other. The treatment of the terminal rod—especially on young vines—is very important. The length to be left every year until the space between the vines is filled varies according to the growth made, and much harm can be done to a vine—even a strong growing one—by leaving the terminal rod too long. The outcome of this is that the wood produced from spurs joining the rod and following in to the centre of the vine is considerably weakened, and in many cases dies out, necessitating cutting away a portion of the main arm the following year to force stronger growth. The length of the terminal rod on a strong growing vine should be about 2ft., the weaker the vine, lessen accordingly. The rod and spur system is one which will give abnormal crops for a few years, if used extensively; then for a few years the vines generally yield below normal. In using this system, the correct rod and spur should be selected from a last year's spur, which has produced two good healthy shoots, selecting the terminal shoot for the rod and the shoot next to the base bud as the spur. The following year, when pruning, always cut the old rod clean out, and work back on the new wood produced from the spur. This system of pruning is not used to the extent that it was a few years ago, the chief fault being that the rod in many cases smothers and weakens the shoots produced from adjoining spurs. Fruit also is generally smaller, and takes longer to ripen. Although not advocating the rod and spur system to be used to any great extent, this last three or four years the writer has used a short rod sufficiently long to tie down on the wire carrying the main arm, looping it as much as possible, and by doing this almost every bud shoots. This is only practised on vines making strong growth where there are not sufficient spurs to produce the quantity of fruit the vine should carry. This has given reasonably satisfactory results, although by comparing the fruit obtained from the rods with that from spurs for the last season the fruit produced from the latter was a little better. Nevertheless, good average crops and quality have been harvested, and the vines are in good heart. An important point which should never be neglected is the cutting out of all dead wood.

In summing up, each person who prunes his vines should—if he has the interest of his garden at heart, after a period of years—be the best judge in reference to its pruning. After years of cutting the removal of old spurs will necessitate large cuts, which do not heal over, and eventually cause part of the main arm to die. Many old vines are affected in this manner, and although the root system of these may be quite satisfactory, they are unprofitable. Many growers have made the mistake of leaving such vines clinging to them for only the few small bunches every year, whereas if a system of rejuvenation had been followed financial results would have been very much better. Such vines should be sawn off near the ground, which would force a new shoot —if one is not already there—meaning the loss of one crop, but giving practically a new vine, which will produce far heavier crops and better quality fruit. A great future

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LIVESTOCK FOR SALE.

During the next few weeks the College can offer for sale the following animals from their well-known flocks:—

Berkshire Boars, from 8 weeks to 8 months old.
Berkshire Sows, from 8 weeks to 8 months old.
Berkshire-Tamworth Crossbred Sows.
Jersey Bulls and Bull-calves, from Tested Herd-book Cows.
White Indian Runner Drakes and Ducks.
White Leghorn Roosters.
Black Orpington Roosters.

— FULL PARTICULARS FROM THE PRINCIPAL. —

is ahead of the currant industry. Throughout the world-wide depression this industry has not only held its own, but has improved its position. This fact alone should urge growers to keep the industry in the position it now holds, and this can only be done by cultivating still more that spirit of co-operation in the growing and marketing of its products.'' (Secretary, A. Jenner.)

YORKE PENINSULA DISTRICT.

(TO BUTE.)

BRENTWOOD (Average annual rainfall, 15.54in.).
July 7th.—Present: 15 members.

Repairs.—The following paper was presented by Mr. H. Boundy:—''Before starting seeding see that all swings and chains are in good working order, The combine, being one of the main implements used during seeding, should have all worn parts replaced, a new set of shears, and it is always advisable to fit a new set of bolts if working in stony country. The harrows are very important in seeding time. They should be sharpened and straightened, because loose harrows miss a lot of ground and blunt ones only pass over the surface. The plough should have all the furrows straight, bolts tight in the feet, and a sharp set of shears ready for work. When seeding and fallowing are over, fences and gates should be mended; a few wires strained up at the right time saves chains of new fence during the year. The binder should be overhauled, the knife taken out and sharpened, and fingers tightened and closed down will make a considerable saving on the pitman. Good straps and buckles on the canvasses save much time and trouble. Headers should have the main working parts taken to pieces so that the bearings and spindles may be inspected. The threshers should be inspected and set ready to start on the barley crop. The combs should be taken off every three or four seasons, ground, thimbled, and reset to make a clean job. When harvesting is finished, collars should be relined. The man on the farm has to be a jack of all trades, because it would cost a very considerable sum of money if one had to take all repairs to the blacksmith, carpenter, and motor garage.'' (Secretary, E. Carmichael.)

WEAVERS (Average annual rainfall, 16.80in.).
July 11th.—Present: 12 members and five visitors.

Fallowing.—Mr. A. Cornish presented the following paper:—''Fallowing is a very important part of farm work. There are three distinct types of soil in this district: (1) grey loam, (2) heavy red ground usually interspersed with limestone ridges, and (3) sand. The two first named can be worked similarly although the red flats should be ploughed a little deeper than the grey loam. In these soils fallowing should be commenced as soon as possible after seeding, using a plough for the first breaking up of the soil and ploughing 2in. or 2½in. deep. The fallow should then be harrowed twice, crossing the ploughing as much as possible. Should the ground have broken up very lumpy, it should then be rolled with an ordinary land roller or cultipacker. The fallow should then be cultivated whenever a growth of weeds renders it necessary. I favor the cultivator for all subsequent working of the fallow; it tends to bring the clods to the surface and packs the fine soil into a firm seed-bed, free from air spaces, whereas the skim plough brings the fine soil to the top and leaves the seed bed in a looser condition, which allows of more evaporation. Harrows should be used whenever a crust has formed on the fallow, this breaks the connection between the surface and subsoil, thereby stopping evaporation. Care must be exercised in working the red ground to see that it is not wet enough to be boggy, or it will set too hard to work down nicely again. Sheep should be run on the fallow whenever weeds appear, for in addition to cleaning the land, they help pack the soil together and enrich the ground with their droppings. Before starting to fallow, it is advisable to have kept the sheep on the paddock as much as possible because a lot of weed growth prevents the soil from working down nicely. The sandy soil which is liable to drift should be ploughed later —about September—and cultivated once. In working the fallow it is advisable to cross cultivate it whenever possible, as when going the same way the tines follow the old track and so allow many weeds to slip past. More ground should not be ploughed than it is possible to work properly, and the fallow should be cultivated at least twice before harvest.'' (Secretary, H. Cornish, Stansbury.)

WESTERN DISTRICT.

CUMMINS (Average annual rainfall, 17.77in.).
June 10th.—Present: Eight members.

Barley Growing.—Mr. P. Vanstone, in the course of an address on this subject, said his first experience of growing malting barley was on Yorke Peninsula, and on fairly new land it proved a failure, but on old land ti did well. His experience in this district was similar to that on Yorke Peninsula as regards yields, also in that it did not affect the following wheat crop if it was old land. He sowed barley on burnt wheat stubble land, sometimes sowing the barley straight in with the combine, other times working the land over and sowing later. It made no difference to the subsequent wheat crop whether the barley stubble was burned off or not. He preferred not to burn it, and it made such splendid sheep feed, and when ploughed in served to keep the soil from binding. A good discussion followed, and Mr. Vanstone replied to numerous questions. Would sow three acres to a bag in early part of seeding, later sow thicker. About 60lbs. super was a fair dressing for barley. The heavy land was best for barley in this district. He preferred formalin for pickling. As regards selling barley, he thought it best rule to make early sales. (Secretary, H. Roberts.)

ELBOW HILL (Average annual rainfall, 11in. to 12in.).

June 14th.—Present: nine members.

Fallowing.—Mr. R. Wake read the following paper:—"Fallowing is one of the most important parts of farming and also one of the most difficult to accomplish. It is important because it is a means by which farmers are enabled to increase their yields by many bushels per acre if properly done. In a very good season the difference in yields per acre is much less than in less favored seasons, as will be seen from the following tabulations—the State average.

	Crop grown on fallow.	Crop grown on land not fallowed.
1928-29	10¾bush.	3¾bush.
1929-30	9bush.	3bush.
1930-31	11bush.	4bush.
1931-32	14⅓bush.	7½bush.

The best crops are grown off early fallow, *i.e.*, fallow that has been completed before the end of the winter rains. By so doing the maximum amount of moisture is conserved and there is a better chance of killing weeds. Fallowing consists of three essentials: preparing a seedbed, conserving moisture, and killing weeds. In dry seasons when there is a short growth of weeds, the lighter ploughs and cultivators do effective work. In the better seasons of early rains, a considerable growth of weeds and bushes spring up, making it difficult to fallow unless the rubbish is kept down by sheep. The best implement to use for this is the mouldboard plough, which makes a level seedbed and turns the rubbish under; when the land is covered with bushes and

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WHITE LEGHORNS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

BLACK MINORCAS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

Free on Rail, Salisbury. DELIVERY.—CHICKS—February and Early March.
EGGS—January and February.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Victoria Square, Adelaide.

C. F. ANDERSON, Poultry Expert.

shrubs the disc plough does good work, and being lighter in draught than a mouldboard plough one can get over the ground more quickly. It does not pay to plough deeper than 2in. to 3in. because seedbed consolidation is difficult to obtain. The cultivation of the fallow is just as important as the ploughing. It is not advisable to cultivate these soils to a smooth surface, because the wind is almost certain to spoil the work. It seems quite necessary that the surface be left ridged during the windy period of the year. It would seem that too much cultivation prior to harvest leads to drift. The practice of most farmers is to work the land during spring and after that control the weeds by sheep. If cultivated when the soil is moist, there is less tendency for it to drift and less loss of moisture. Given the right conditions, working fallow between harvest time and seeding seems to have a very beneficial effect upon the soil, especially is this noticed if rain falls at the end of summer or early in autumn. Rain is the real consolidating factor, and farmers should try to work the fallow as shallow as possible with effective destruction of weeds. If all these things have been done well the fallow should be free from weeds and ready to grow a good crop of wheat.'' Discussion: Mr. Story only used a plough for fallowing when it was absolutely necessary. It was not wise to plough too deep. A crop of wheat sown on land ploughed deeply grew too much straw, whereas on shallow ploughing the reverse was the case. He was not a lover of the disc plough. Mr. Wills said ploughing the land brought about the aeration of the soil, which was assisting Nature in making an ideal loamy soil. A firm seedbed was one of the main things to have at seeding time, when a good germination would result. In different districts the land was ploughed at different depths. Mr. Wildman said rainfall had much to do with the depth of ploughing. There was no harm in ploughing deeply in a wet season. In dry seasons the land was too loose to allow of that being done. Mr. S. V. Wake said the combine had been all right in dry seasons, but now it was necessary to use the plough. It was a good opportunity to cope with the magnesia patches in the land. Mr. White noticed with interest the different depths farmers ploughed in different districts. In heavy black land 6in. was not uncommon, and in dryer districts 2in. was about the average depth. A good crop usually grew on an old roadway through a paddock. Mr. Cooper favored the plough, especially for heavy land. Deep fallowing was no good; 2in. to 3in. was the ideal depth. The disc plough may be all right in straw and rubbish. The combine was the ideal implement for seeding, because it placed the grain on a firm, hard seedbed. (Secretary, W. Cooper.)

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BARMERA.

May; Present: 30 members.

Manuring Fruit Trees and Vines.—The following points are taken from an address by Mr. F. R. Arndt (District Horticultural Instructor):—Manuring was often an experiment for the individual blocker and needed common sense. All soils would not yield to similar treatment. Heaviest application of manures, also ploughing, should be done before the end of August. An average ideal system of manuring:—(*a*) Cover crop (peas or beans) together with heavy dressing of super (3cwts. per acre); (*b*) Before buds burst, give 2cwts. super, 1cwt. sulphate of ammonia; 1cwt. of blood and bone manure may be added, also 1cwt. of potash in sandy soil.

At the July meeting Mr. Arndt addressed blockers on ''Grafting.'' A profitable evening was spent, 50 members attending. The lecturer referred to ''Phylloxera,'' emphasising South Australia's practical immunity. Stock affinities did not pay so large a part in grafting as in previous days. The doradillo was a suitable stock for grafting sultanas, currants, malagas. Shiraz on doradillos did not do well. It was advisable to graft below ground level and too many vines should not be prepared ahead. The preparation of the scion was outlined in detail, and a ''live'' model did much to drive home the lecture. Mr. Arndt thought it advisable to graft in early September after the first rush of sap had taken place. Layering and whip graft were explained, and also the yema or summer bud. (Secretary, C. Till.)

ALAWOONA FIELD DAY.

The Alawoona Branch of the Agricultural Bureau took advantage of the presence of officers of the Department of Agriculture in the district and arranged a tour of inspection of farms in the vicinity of Alawoona. Six car loads of members, in company with Messrs. W. J. Spafford, H. B. Barlow, R. L. Griffiths, P. H. Suter, and F C. Richards, of the Department of Agriculture, took part in the tour. Leaving the Institute at 11 o'clock the first property to be inspected was that of Mr. T. Willson, who, before coming to Alawoona in 1914, was engaged in farming operations on Kangaroo Island.

e recalled the time when crops were cut with a sickle, and the stir that the first ornsby binder created when it was brought to the Island. His present holding, which s all fenced and consists of 1,514 acres, all of which is cleared except 100 acres. This year he has under crop 500 acres—400 acres being wheat fallow and 100 acres of oats. A crop of Rajah on present indications is expected to yield 15bush. to the acre. The outstanding feature of Mr. Willson's property is the fine vegetable and fruit gardens. From the fruit garden, which was planted nine years ago, he expects to gather 30 cases of fruit, including apricots, peaches, nectarines, plums, and apples. Other than a bucket of water given to each tree when it was planted, the trees have not received any watering, except rain, and at present are very healthy and free from disease. Surplus fruit and vegetables are sold in Alawoona.

A very fine crop of 60 acres of Guyra oats, sown the third week in March with 35lbs. seed and 50lbs. super on stubble land, was inspected on Mr. H. J. Koch's holding. The crop is quite 5½ft. high, and is expected to cut 1½ to 2 tons of hay to the acre.

Mr. T. B. Flint, who took up land in 1914 when the district was first settled, has a holding of 1,882 acres—200 acres of which remain to be cleared. Sown to wheat this year he has 450 acres, and 120 acres of oats. His best crop was one of Nabawa, which should yield six bags to the acre. To provide adequate grazing for a flock of 200 Merino sheep, Mr. Flint has sown Wimmera rye grass all through his wheat crops, and in addition has a plot of 2½ acres of the grass, which he intends to harvest for seed.

Perhaps the best and most attractive crop inspected was one of 70 acres of Nabawa wheat on the farm of Mr. A. Bishop, who, before taking up wheat growing, was a gardener at Mount Compass. This crop, which was sown with 45lbs. seed and 70lbs. super in mid-April, was at the time of inspection clean, level, and very dense, and gives every appearance of returning 8 bags to the acre. He has 400 acres under wheat this year, and proposes to make adequate provision for fodder supplies by cutting 60 tons of Golden Drop wheat for hay.

Mr. W. Paull, who is Chairman of the local Branch of the Bureau, and last year won the District Crop Competition, works—in conjunction with his son—two properties, containing 3,500 acres. On this holding very fine crops of Caliph and Gallipoli and Nabawa were inspected. Realising that as a general rule the mallee lands will not stand consistent cropping, Mr. Paull practices a rotation whereby the paddocks only come under wheat once in five years. He expressed the opinion that right through the mallee many farmers put in too large an area. This they cannot handle properly. In proportion to the size of his holding, Mr. Paull said he put in a smaller area of wheat than anyone in the district, and at the same time there were few who marketed more wheat than him. Provided a good finishing rain is received, Mr. Paull anticipates a yield of 30bush. to the acre from a paddock of 115 acres of Nabawa. Mrs. Paull was complimented on her very fine flower garden, which was a blaze of color at the time of the inspection. Visitors were entertained at lunch and tea by the ladies of the district, and a most instructive and enjoyable day concluded by a concert in the Institute.

SOUTH AND HILLS DISTRICT

BELVIDERE.

May 21st.—Present: 11 members.

Horses *v.* Tractors.—The Hon. Secretary (Mr. M. Pearce) read the following paper:—"Tractors are heavily handicapped by their high initial cost and unknown costs for repairs and upkeep. Petrol, oil, &c., imported from abroad is paid for in cash or goods; whilst horse feed is grown on the farm with little more than the farmer's own labor." The speaker thought that if a farmer wanted to work a tractor it would be essential to have a large area and keep the tractor going day and night to get the crop in at the most opportune time in the season and thereby possibly increase the yield. He also thought that the only other occasion a tractor may be used economically was when horse feed could not be grown; as in clearing new country. Several members thought a tractor would be a benefit to help the horse team in the busy times. Mr. Watson said that a light tractor could be used on a small dairy farm because it would allow feed to be given to cows which would otherwise be eaten by horses. Mr. E. Sparrow cited the case of a tractor in the Bordertown district which, working in shifts, put in 700 acres in 12 days, including cultivating, drilling, and harrowing. The general opinion of members was that horses were the best for farm power.

A meeting was held on June 16th, there being present 15 members. Mr. R. Hill (District Agricultural Instructor) delivered an address, "Seeding Operations."

CROWN LANDS.

LANDS OPEN TO APPLICATION.

Applications will be received until 3 p.m. on Tuesday, October 18th, 1932, for lands in the Hundreds of BARNA, BLACKER, BOOTHBY, BROOKER, BUCKLEBOO, BURGOYNE, CAMPOONA, CARALUE, CARAWA, CARINA, COLTON, COOTRA, CUNGENA, FINLAYSON, GOODE, HAGUE, HASLAM, KIANA, KOONGAWA, LAKE WANGARY, MAMBLIN, MANGALO, McLACHLAN, MILTALIE, MINBRIE, MINNIPA, MITCHELL, MOODY, MOORKITABIE, MORTLOCK, MOSELEY, PYGERY, ROUNSEVELL, SHANNON, SMEATON, SOLOMON, STURDEE, ULYERRA, VERRAN, WANNAMANA, WRENFORDSLEY, YADNARIE, and in the Counties DUFFERIN, KINTORE, and ROBINSON.

Full particulars are published in the *Government Gazette* of September 8th, 1932, and plans and detail may be obtained on application to the Director of Lands, Box 293A, G.P.O., Adelaide.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. Richards, Commissioner of Crown Lands.

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All communications to be addressed:
"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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S. B. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Australian Wine—Growing Use in the United Kingdom.

The great increase in the export of Australian wine to the United Kingdom is mentioned in the Report on Wine which has been issued by the Imperial Economic Committee (H.M. Stationery Office, 6d.). Australian wine is firmly established and the consumption of it in the United Kingdom has been increasing during the last three years, although the general consumption of wine has declined. Australia itself, says the Report, consumes just over 6 pints a head, where South Africa consumes 15 pints. The United Kingdom consumes just over 2 pints of wine a head. Australian exports were greatly stimulated by the export bounty, which, at varying rates, has been in force since 1924, and increased fivefold, to two and a half million gallons, in six years. This is about half the estimated quantity consumed in Australia itself.

The report gives the world's total annual production of wine at around 400,000,000 gallons, half of which two countries, France and Italy, provide. The British Empire only provides 1.31 per cent. of the total.

UNITED KINGDOM MARKET.

In a careful study of the United Kingdom market, it is estimated that the average amount of wine drunk annually per head of the population is some 2½ pints. Consumption has been practically constant since 1886. There has been a certain change of taste towards sweet and away from dry wines, and it is in providing good sweet wines that Empire growers have a particularly favorable field. The steady consumption of wine, although the duties were doubled in 1920, is in part due to the increased taxation on beer and spirits. Taxation and preference play a great part in changing public taste, as the classic example of port wine shows, and under the new Imperial preferences Empire growers have an excellent opportunity.

RECOMMENDATIONS TO EMPIRE GROWERS.

The Report recommends growers to seek to put on the British market a few aristocrats among wines, whose undisputed excellence will confer prestige upon the land from which they come. Mr. H. Warner Allen, a recognised authority, is quoted in praise of South African sparkling wine, dry Dominion, and of distinctinve Australian wines. These wines have qualities of their own, but they have to make their way in a market whose taste is already trained by the wines of Europe. Just as the wines of France, Germany, Spain, and Italy are all quite different, and are not compared against each other, so should the Empire wines win their own niche.

Great efforts are now being made to improve quality, and it is recognised that much harm was done by the premature export of inferior wines some years ago. In hotels and restaurants, in particular, the goodwill of the management is of little effect where consumers choose the foreign label "either through fear of venturing on the unknown or on evidence of their supposed knowledge." The report points out that organisers of public and official dinners, old boys gatherings and similar functions have a great chance of giving prominence to Empire wines worthy of serious consideration.

BLENDED WINES.

Empire growers have to face the competition of blended European wines, which are blended not for improvement, but simply to obtain a wine on which the duty works out at nearly the same as the duty paid by Empire wines. The practice of adding spirit to Empire wines in bond to obtain alcoholic strength is one which injures the name of Empire wines.

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NAMES FOR WINES.

Such names as Burgundy and Claret have for long been used to describe types of wines and not particular localities. Australian Burgundy, for example, has been on the market for over sixty years. But Port and Madeira are words whose use is restricted by law to certain localities. Port constitutes over a quarter of all the wine imported into Great Britain, and the Portuguese enjoy a very great advantage. Empire producers of wine of port character have added such words as Port Type, but there are great disadvantages in this practice, which suggest an imitation. It follows that very careful consideration should be devoted to the possibility of inventing new names for Empire sweet wines. "Austral" or "Aust" have been proposed for Australian sweet wine, or the revival of old names like Malmsey. In general the Report pleads for an acceptance of the view that the usual names for Wines have become general in meaning and ought not to be limited to particular countries.

NEED FOR LARGER EXPORTS.

The two great Wine producing countries in the Empire are Australia and South Africa, although Canada, Cyprus, Malta, and Palestine all produce Wine, and there is British Wine—elderberry, cowslip, ginger, &c. Australia consumes less than a third of her own production of around 18,000,000galls., while South Africa, whose total production is about 19,000,000galls., only exports between 4 per cent. and 5 per cent. of it. Australia exports more than twice as much as South Africa, and both countries send over 90 per cent. of their exports to the United Kingdom. But total sales have not kept pace with production. Larger export markets, alike for Wine and Brandy, are the chief need of both countries. Markets in Empire countries, other than the United Kingdom, deserve attention, though few of these countries at present give tariff preferences to Empire Wines.

BRANDY.

The increased sale of brandy indicates a way in which Empire producers can extend their markets. South Africa is a particularly large consumer, and annual consumption per head is 12 times what it is in the United Kingdom. Australia consumes five times, Canada three times as much per head as the United Kingdom, where consumption has been decreasing for many years and is now only half a million proof gallons. Empire brandies have to compete in a narrowing market with established foreign brandies. France, in fact, enjoys a monopoly, and the public relies on the names of a very few well-known shippers of French brandies.

Empire brandy thus finds it difficult to obtain the recognition its high quality deserves, and is only ½ per cent. of all the brandy consumed.

The laws of Australia and South Africa are strictly administered and guarantee that brandy is properly manufactured from wine and properly aged. South African brandy has been used by the London County Hospitals as their sole brandy for the last five years, and is in use in more than 400 hospitals in the United Kingdom. If producers can produce in time a few liquor brandies of the highest type it will greatly help to establish Empire brandies.

Fertiliser for Maize.

The Myponga Agricultural Bureau asks "What is the most suitable manure for a crop of maize growing on swampy land"? Mr. W. J. Spafford (Deputy Director of Agriculture), in reply, says maize grows really well on peaty soils, provided the crop receives sufficient mineral manures. To ensure a really heavy forage crop of maize, about 3cwts. superphosphate per acre should be drilled in with the seed. If the crop is to be grown for grain, from 2cwts. to 3cwts. superphosphate and ½cwt. to 1cwt. muriate of potash should be applied per acre. More important than manure, however, is the necessity to grow the maize in rows, and keep the land between the rows well cultivated while the plants are small enough to permit of cultivation.

Publications Received.

"Narcissus Pests," Bulletin 51. Ministry of Agriculture, England. Price, 1s. net.

"Some Diseases of Poultry," Bulletin 6. Ministry of Agriculture, England. Price, 8d. net.

"Clean Milk Competitions," Bulletin 46. Ministry of Agriculture, England. Price, 4d. net.

"Weeds of Grass Land," Bulletin 41. Ministry of Agriculture, England. Price, 5s. net.

"Cabbages and Related Green Crops," Bulletin 53. Ministry of Agriculture, England. Price, 9d. net.

"Salad Crops," Bulletin 55. Ministry of Agriculture, England. Price, 1s. 6d. net.

Annual Report, Department of Agriculture, Kenya, 1931.

The Friesian Herd Book of Australia, vol. II.

"Mushroom Growing," Bulletin 34. Price, 9d. "Modern Milk Production," Bulletin 52. Price 9d. Ministry of Agriculture, England.

Nutrition Abstracts and Reviews. Rowett Institute, Aberdeen. Price, 6s. 6d.

"Cheesemaking," Bulletin 141. Price, 1s. New South Wales Department of Agriculture.

"Tree Planting on the Farm," Bulletin 17. Price, 1s. New South Wales Department of Agriculture.

"Mallee Farming," Bulletin 168. Price, 1s. New South Wales Department of Agriculture.

World Economic Survey, 1931-32.—This publication, issued by the League of Nations, gives a review of the development of the world depression up to the middle of July, 1932. Illustrations of economic developments are drawn from different countries or group of countries, but the description throughout is of world problems. Special references are made to the disorganisation of production, prices, and trade, the growth of unemployment, and public finances. Australian agents: H. A. Goddard Limited, 255a, George Street, Sydney.

HORTICULTURAL INQUIRIES.

[Replies supplied by Mr. Geo. Quinn, Chief Horticultural Instructor.]

Orange Trees Shedding Young Fruits.

Kimba Agricultural Bureau. "What is the cause of orange trees shedding young fruits"? Reply—It is suggested that the trunk of the tree be cinctured when the blossoms are just falling freely. This consists of selecting a smooth, round place on the trunk, and with a sharp knife making a clean cut right around the trunk, pressing the knife edge through the bark until the resistance of the wood is freely felt. If the tree is very vigorous, make a second cut about 6in. or more above or below the first. Do not try to lift the bark or take out a strip, but make a plain, clean, straight cut right around the stem.

Preventing Ants Ascending Fig Trees.

Appila Agricultural Bureau. "What is the best treatment to prevent ants ascending a fig tree and spoiling the fruit"? Reply—Fix a rubber or tough, grease-proof paper band about 6in. wide around a smooth part of the stem and keep it smeared with a mixture of tar and just sufficient oil or grease to prevent the tar drying off and losing its stickiness. Any kind of sticky band will do, but do not allow any oily or tar mixture to run down on to the bark of the trree.

Making a Plum Tree Fruit.

If the tree is a variety which is known to set fruit in other gardens without the presence of another plum which blooms at the same time, then the cause of non-fruiting may be due to some cultural defect. Usually, such trees, if healthy and vigorous, are more likely to flower and set fruits if left unpruned for a season or two. Driving nails into the trunk may give a check to the sap flow, but if that is necessary, probably cincturing by running a knife cut around the trunk when the blossoms are fully expanded would probably act more directly. If the tree flowers freely, and never holds its fruits, it probably bears self sterile blossoms, and needs the presence of another plum which blooms simultaneously with it. This can be tested by placing flowering twigs (if obtainable) from another kind in tins of water, and hanging them up amongst the flowers of your own tree. The bees and insects will effect the necessary cross pollination.

Preventing White Ants Attacking Fruit Trees.

No reliable and non-injurious preventive is known which can be inserted into the trunk, but white ants could be attracted and poisoned by soaking the lower half of pine or stringybark stakes in a solution of arsenic and driving them into the ground around the tree stem. White arsenic may be dissolved by boiling it with about twice its own weight of washing soda, or by treatment with equal quantities of caustic soda in a small volume of water.

VETERINARY INQUIRIES.

[*Replies supplied by Veterinary Officers of the Stock and Brands Department.*]

"Tweedvale".—What is the value of saltpetre, treacle, and ginger as a preventive for mammitis, given before calving.

Reply—Mammitis (inflammation of the udder) is due to the entrance of germs into the udder, and there is no medicine which will prevent the disease, and the only effect of giving these ingredients would be to increase the action of the kidneys and help to keep the bowels in a laxative condition. The best preventive for mammitis is to keep the animal in a healthy condition by good feeding and under cleanly conditions, and if any drench is required to keep the bowels active, give Epsom salts 1lb. to 1½lbs., with ginger 2ozs., treacle 1lb., and water 2 pints as one drench.

Secretary, Aguricultural Bureau, Palabie, reports cow which is eating horse manure.

Reply—This is an indication of a mineral deficiency in the food, and most probably the deficiency is phosphorus. This can be rectified by supplying any of the following mixtures:—(1) Di-calcic phosphate, 40 parts; common salt, 60 parts. Mix thoroughly, and in some bran and chaff give 1oz. for each gallon of milk produced per day. (2) Sweet bone meal, common salt, equal parts. Mix well. (3) Superphosphate, common salt, equal parts. Mix well. The quantity of Nos. (2) and (3) mixtures to be fed is the same as in feeding No. (1) mixture. Young growing animals should also have free access to any of the above mixtures, which can be kept in a cut down kerosene tin sheltered from the weather. Di-calcic phosphate can only be purchased from the Crosco Co.

Secretary, Agricultural Bureau, Weavers, asks—"What is the best preventive for bot flies"?

Reply—There is no known effective remedy for preventing the fly from "striking" horses. To minimise as far as possible the chances of the animals becoming subsequently infested with the larvae, the eggs, after they have been deposited on the hairs of the coat, can be destroyed by singeing or by smearing with raw linseed oil 2 parts, kerosene 1 part.

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"Paruna" reports mare stiff in all four legs following difficulty in foaling four weeks previously.

Reply—The symptoms are those of inflammation of the sensitive structures of the feet (laminitis), which is not an uncommon condition, and in this case is probably a complication following inflammation of the womb. *Treatment.*—If possible place the mare in a shallow foot bath made by digging a trench and filling with water sufficient to cover the feet as high as the fetlocks. Before placing the mare in the bath and filling with water, the bottom of the bath should be covered with chaffed straw in order to prevent the suction of wet clay on the feet. Keep the mare in the bath all day, and remove her into a stall well bedded with straw. The heels of the feet should be rasped down in order that the weight is taken off the front of feet. If constipated, give 1½ pints of raw linseed oil as one drench. Feed on green feed, bran, and a little boiled grain. In the latter can be mixed 2 tablespoonsful of baking soda twice a day.

"Mount Cooper" asks if a bull is likely to be injured if allowed to serve cows at 12 months old.

Reply—It is recommended that bulls be used only to a limited extent from 15 months to 2 years. If the bull is used only occasionally no ill effects will occur.

"Wepowie" asks the probable cause of a mare carrying a dead foal.

Reply—1. A serious fall may lead to the death of the foetus, in which case abortion usually occurs. In the case you mention the period between the fall and the taking away of the foetus was probably too long for the accident to be connected with the death of the foetus. 2. Abortion in the mare may be caused by—(1) A serious illness, *e.g.*, colic; (2) severe and excessive work, especially if mare is unused to it; (3) accidents, *e.g.*, kicks, falls; (4) many mares abort the 12th week of pregnancy, as attachment to foetus to breeding bag is very weak at this time; (5) disease of the uterus; (6) contagious abortion rarely occurs in mares. 3. The abundance of early green feed would not cause abortion, unless the feeding of it gave rise to colic or laminitis, *e.g.*, horses are frequently put on to green crops and the sudden change and excess of feed often leads to an attack of founder, which in a pregnant mare may cause abortion. 4. Duration of pregnancy in mare is on an average 48 weeks (from 305 to 400 days).

Secretary, Agricultural Bureau, Frayville, asks the cause of horses stamping their feet and rubbing against fences.

Reply—The probable cause is the presence of a small parasite in the hair of the legs below the knees and hocks. The treatment indicated is the application of the following dressing two or three times, at intervals of 4 to 5 days:—Take raw linseed oil or any vegetable oil 1 pint, lysol 4 tablespoonsful. Shake thoroughly before applying with a brush to affected legs, rubbing the mixture in.

SALT IN WATER.

[*Quantity Tolerated by Horses, Cattle, and Sheep.*]

Mr. R. H. F. Macindoe, B.V.Sc., M.R.C.V.S. (Deputy Chief Inspector of Stock), advises the Secretary of the Milang Branch of the Agricultural Bureau, who sought information on the above subject, that—(1) Horses will thrive on water containing 400 grains common salt and 550 grains total solids per gallon, and, provided they are not worked, may be sustained on water containing up to 638 grains salt and 950 grains total solids. Water containing as much as 798 grains salt and 1,022 grains total solids has been used for a period of three months without ill effects. (2) That cattle will thrive on water containing 800 grains common salt and 1,000 grains total solids, but when the concentration reaches 970 grains salt and 1,300 grains total solids they are injuriously affected. (3) That sheep will thrive on water containing 800 grains common salt and 1,000 grains total solids, and will do well even up to 1,197 grains salt and 1,350 grains total solids. When the concentration reaches 1,277 grains common salt and 1,868 grains total solids the sheep are injuriously affected.

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SOME POINTS IN THE HANDLING OF A FAT LAMB FLOCK ON A MALLEE FARM.

[By ARTHUR J. PERKINS, Director of Agriculture.]

(*Paper read at the Forty-third Congress of the Agricultural Bureau, September,* 1932.)

1. INTRODUCTORY.

The title of my address commits me to the discussion of the position of Sheep on a Mallee Farm; and whilst I shall try to do justice to this commitment, my main aim tonight will be to use it in such a manner as to stress not merely the advantages, but in existing economic conditions the imperative necessity of associating Live Stock operations—Sheep, Dairy Cattle, Pigs, Poultry—with Wheat in whatever part of the State the latter may be grown, and perhaps I should add of the Commonwealth as well. I need scarcely remind you that within recent years rural producers generally have had to face an unprecedently low scale of prices for their products coming in quick succession to post-war inflation; and that this phenomenon, which might have been foreseen, but was not, has led to painful economic readjustments throughout the community. Rural producers have suffered in common with others, but let us not forget that the chief sufferers have been those who are still tramping the streets of our cities in search of work. It is probably true that on a strict accountancy basis neither Wheat Farming, Sheep Farming, Dairy Farming, Poultry Farming, &c., taken singly, is a paying proposition at prices current to-day; but it does not follow that a judicious combination of two or more of these lines of rural activity should not suffice to help individual farmers to retain a firm grip of their holdings until such time as general world economic settlement leads to a return of more normal prices. If this be granted, the present day ideal farm would appear to me to be a farm as nearly as possible self-sufficing, purchasing a bare minimum of outside necessaries, bringing to market a maximum of saleable commodities, and providing throughout the year continuous employment for the farmer and his family. If the outlet for the farmer's saleable commodities were strictly confined to a limited home market, it is obvious that the general adoption of a policy of this kind would ultimately prove suicidal; fortunately, however, the commodities we have in mind—Wheat, Wool, Fat Lambs, Barley, Butter, Cheese, Frozen Pork, Eggs, &c.—all have recognised over-seas values which, although undesirably low at the present moment, are not altogether prohibitive when expressed in terms of a high adverse exchange rate. I realise one difficulty, indeed an insuperable difficulty for some settlers, namely, reasonable over-seas marketing facilities: its discussion would, however, involve me in matters of State policy, which are outside my province; and I must leave its solution to the powers that be.

It has always seemed to me that in any country, but particularly so in a country dependent upon rural production for its very existence, land ownership was in the nature of a trusteeship, with moral obligations that no owner could afford to overlook, namely, that broad acres should be exploited not merely for the private advantage of the occupier, but in addition for that of the community as a whole: and if this be granted, no cleared farm that brought nothing more than Wheat to market could be said even in the best of circumstances to be adequately filling the requisite functions of a farm, but particularly not so in existing economic conditions. From the bare standard of Labor requirements alone, can it be seriously maintained that Wheat affords scope for continuous employment from one end of the year to the other? As to associated economic disadvantages of this single crop I shall have occasion to refer to them at a later stage.

It is my firm conviction that the future success of Wheatgrowers throughout the Commonwealth is dependent very largely upon the extent to which they are able to adjust themselves to the association of Wheat with Live Stock operations: and, if in the sequel I confine my remarks to Sheep in support of this conviction, it will not be because I underrate the value of Cattle, Pigs, or Poultry in the same connection. Indeed, if I were asked off-hand what type of Live Stock I would in present circumstances recommend for a Wheat grower of limited means and credit, I should unhesitatingly recommend Dairy Cattle as a first instalment: and I find it difficult to believe that any kind of farm—be it a wheat farm, a dairy farm or even a fruit farm—can afford to be without its flock of hens. If, therefore, I confine my remarks to Sheep it is because my colleagues—Messrs. Barlow and Anderson—will deal very adequately with Dairying and Poultry tomorow evening.

It remains for me to justify my selection of the Mallee for purposes of illustration in preference to the State as a whole. My reasons may be stated as follows:—

a. I happen to have precise data on the subject from a Mallee farm, which are essential to my arguments.

b. For a variety of reasons Live Stock operations on Wheat Farms have hitherto been neglected to a greater extent in the Mallee than elsewhere in the State.

c. And yet for both technical and economic reasons the presence of Live Stock on Mallee Farms is more essential to the success of wheat growing than elsewhere in the State.

d. And finally, from the arable standpoint, South Australia is a Mallee State to a far greater extent than is usually suspected.

My last reason is supported by the following facts: Latest Statistics—1930/31—give 15,602,000 acres as the total area available for cultivation in South Australia: of this area I calculate 10,199,000 acres, or close on two-thirds to be in Mallee country: similarly, in 1930/31 the area under Wheat in South Australia was 4,181,000 acres, of which 2,940,000 acres, or over 70 per cent., were in Mallee country; the area under Bare Fallow, 2,495,000 acres in South Australia, and 1,349,000 acres, or 54 per cent. in Mallee country; the area under Oats and Barley 470,000 acres in South Australia, and 335,000 acres, or 71 per cent., in Mallee country; and, finally, the area under all other crops 775,000 acres in South Australia and 376,000 acres, or 49 per cent. in Mallee country. These data should suffice to stress the importance of Mallee country in South Australia.

If we take into consideration the fact that Mallee country cannot be brought under Wheat to advantage more frequently than once in every three or four years, we may note incidentally that the maximum area under Wheat that the State is normally capable of carrying in any one year is not likely to exceed 4½ million acres.

But, if Mallee country cannot carry Wheat to advantage more frequently than once in every three or four years what is to be done with the land in intervening years? Is it to lie idle and recuperate, and provide grazing grounds for a few working horses—and not even that if tractors are to supply requisite motive power? In such circumstances it will be easy to prove how onerous wheat growing is likely to prove even at prices very much in excess of those that have obtained within recent times.

2. THE IMPERATIVE ECONOMIC FACTOR BEHIND LIVE STOCK ON THE WHEAT FARM.

Quite recently I have had the advantage of analysing the Accounts—1929/31—of a Murray Mallee Farm, on which Wheat growing has been combined with Sheep to the exclusion of all other types of Live Stock. The farm in question is 1,685 acres in area, with an available arable area of 1,655 acres. The mean area sown

to Wheat has been 439 acres, from which an average of 14.78 Bushels to the acre has been reaped. This mean yield per acre must be accepted as good, since over the same period—1929/31—the mean yield per acre in the Murray Mallee Division was 6.03 Bushels only, in the combined Mallee districts of the State 6.37 Bushels and in the State as a whole 7.44 Bushels. The mean area fallowed has been 510 acres and about 100 acres of Oats have been reaped annually for grain, the greater portion of which has been used as seed for grazing crops of Oats to which Sheep and Working Horses have had regular access.

Inclusive mean costs of growing wheat have been as follows:—

	Costs per Bushel. s.	d.
Interest on Land and Improvements	0	4
Interest on Working Capital	0	3
Depreciation on Improvements and Plant	0	9
Rates and Taxes	0	0¼
General Expenses	0	2
Labor	0	7
All other Costs	1	4
Mean Inclusive Costs per Bushel	3	5

In the above statement, in which mean inclusive Costs per Bushel of growing Wheat have been shown to be 3/5, details have been so arranged as to give prominence to those special charges which are so often overlooked in the determination of Costs by Amateurs: if, for instance, the first five items were to be omitted, it could be said with some show of reason that the Wheat costs 1/11 a Bushel only, instead of 3/5; and that even at present prices the owner must have realised quite handsome profits on his Wheat crops. Actually, notwithstanding the owner's recognised ability as a farmer, the Wheat Account closed at a loss of £171 7s. 3d. in 1929-30 and of £529 17s. 1d. in 1930-31.

The point I wish to make, however, is that if Sheep had not been present on the farm to turn to some advantage large areas of land lying temporarily idle, and to take up their share of these special over-head charges, the cost of growing Wheat, instead of 3/5 a Bushel, would have been considerably higher. Let us take a closer view of the position: the mean value of these overhead charges for the whole farm was as follows:—

	£	s.	d.
Interest on Land and Improvements	336	11	11
Interest on Working Capital (excluding Sheep)	103	16	2
Depreciation on Improvements and Plant	404	14	7
Rates and Taxes	25	17	2
General Expenses	123	12	11
Value of Owner's Management and Labor	300	0	0

The above statement shows that mean overhead charges (including estimated value of the owner's Management and Labor) incurred by the farm as a whole averaged £1,294 12s. 9d. per annum. Out of this total £675 16s. 8d. only was debited against 439 acres of Wheat, which returned 6,488 Bushels at harvest time, that is to say, a charge of 2s. 1d. per Bushel: the balance, £618 16s. 1d., may be said to have been taken up by the Sheep Account, since the Oat crops were used almost exclusively by Sheep. Hence, if Sheep, or some other kind of revenue-earning Live Stock, had not occupied the idle grazing areas of the farm, wheat would have been the only revenue earning Account, and would in consequence have been debited with £1,294 12s. 9d. in the way of overhead charges, instead of £675 16s. 8d., with the result that the Wheat, instead of costing 3s. 5d. a bushel, would have cost 5s. 4d.

It follows, therefore, that when on a Wheat Farm we take up Live Stock operations, however much we may do so in the hope of securing direct profits from the venture, nevertheless, in view of the financial relief these operations give to main crops, the former can be taken to have succeeded economically even when they do no more than square the ledger. But one can go further and say that even if Live Stock operations were to show an apparent Loss for the year, so long as this Loss did not exceed the value of the overhead charges of which main crops had been relieved by Live Stock—£618 16s. 1d. in the case under consideration—the farmer would have been no worse off than if his farm had not carried a single hoof of Stock, apart from slightly increased interest charges.

From the above considerations it should be realised, I think, how wasteful from a community point of view is the policy of those who in country on which Wheat can be grown on the same plot of land at long intervals of time only, persist in excluding Live Stock from their farms, and how onerous on their own purses.

3. OTHER ADVANTAGES OF ASSOCIATING LIVE STOCK WITH WHEAT.

Such, then, is the main economic advantage of associating Live Stock operations with Wheat in the Mallee, and one can add over the greater portion of the State. But this, as you will know, is very far from being the only advantage that Farmers derive from this association, apart altogether from possibilities of direct profits. The facts are too well known to need any stressing and I shall content myself with their brief enumeration. In the first place, our unavoidable practice of making eight to nine months of well-tilled Bare fallow precede a crop of Wheat, has the effect of progressively depleting the normal stock of soil organic matter, so essential to its good mechanical condition and to the life functions of useful soil bacteria: depasturing Live Stock and Sheep in particular return to the soil quite appreciable quantities of organic matter in appropriate form. Sheep, too, assist to keep in check undesirable but edible weed growth, which if allowed to go to seed, would lead ultimately to a reduction in crop yields. The presence of Sheep on Bare Fallows is common, I know, and perhaps unavoidable: such a practice should not, however, be abused; it may be good for the fallows—it will certainly help to consolidate them, provided the land be neither over-steep nor over-light in texture—and it will probably lead to an apparent reduction in tillage costs: but "fallow-roaming" has its drawbacks even for the farmer's pocket: over indulgence in it is mainly responsible for "shabby" fleeces and low wool prices and is apt to develop muscle rather than market condition in Sheep. I realise, however, that on present-day farms Wheat is of greater economic importance than Sheep, and that within limits we cannot avoid fallow-grazing; but let us make no immoderate use of it.

4. TYPE OF FLOCK FOR THE AVERAGE FARM.

What type of Sheep is best adapted to Mallee conditions? I know that some argue for a quick turn-over fattening flock and others for a breeding flock; personally, I side with the latter, both from the State viewpoint and from that of the average farmer. It seems to me that farming as an occupation offers sufficient elements of chance to satisfy the gambling instincts of most men; hence, when a suitable alternative presents itself I suggest that the average man should beware of staking his Capital on market uncertainties. Markets have been known to drop unaccountably between purchase and sale time, and "fats" have sometimes realised less than their original value as "stores", to say nothing of those whose misfortune it is at times to buy "fats" and sell "stores"; possibly the latter put undue faith in fallow-grazing. The fact of the matter is that like the poet the successful dealer is born, and not made, and in my experience, I think we can add that like most poets, he is rarely a good farmer. In my opinion, therefore, the average man should pin his faith to a breeding Flock, and where economic conditions permit of it, to what is known as a Fat Lamb Flock; under careful management parturition losses should not as a rule exceed by much those common to casual grazing flocks; breeding Ewes, more at home on the farm, should prove quieter, and hence more thrifty; the danger of introducing undesirable parasites should be lessened; the flock should be at its maximum at that time of the year when grazing facilities are usually at their best and at its minimum when grazing is at its scarcest; and finally, fleeces and natural increase should under normal management ensure some return on Capital, however depressed prices may happen to be at the time.

5. The Fat Lamb Flock.

The breeding Flock, I have said, should be a Fat Lamb Flock whenever local conditions permit of it; by this I mean that if local marketing facilities were such that there was no possible outlet for Fat Lambs, then the farmer must fall back upon Merinos, or preferably perhaps extend his Dairy Herd to the full capacity of farm and family labor. In the matter of the constitution of a Fat Lamb Flock there has been a good deal of difference of opinion in the past, mainly because we have been groping our way through a period of transition in the course of which the influence of local buyers has hitherto proved more potent than that of over-seas markets. And unfortunately, in a matter of this kind local influence makes for chaos, since the local market will accept any type of Lamb that is market prime, and frequently pay more for it than is obtainable at the time for better class stuff on an export parity. Over-seas markets, on the other hand—mainly British ports—are catered for by a number of countries, and are able to pick and choose in the matter of quality nor can we expect to command the most satisfactory prices until we conform to over-seas requirements, as had been done for many years past by New Zealand, and more recently to some extent by Victoria. The British Market requires a sturdy, well built, but not over-fat Lamb, dressing not more than 30lbs., and preferably under; with dark face and points and high quality flesh, free from the tallowiness characteristic of some breeds. At the present time it would be exceedingly difficult to get an even line of Lambs of this type in South Australia, simply because breeders are keeping their eyes fixed upon the local market, and not upon overseas ports. In 1930 we slaughtered 368,531 Lambs of which 20,789 or 5.64 per cent. only were exported: in 1931 total slaughterings rose to 491,403 head, of which 135,386 or 27.55 per cent. were exported. Progress achieved has therefore been quite satisfactory, and if it can be maintained at the same rate, Lambs slaughtered for export will soon exceed those retained for home consumption: and when this is brought about the export trade will impose its standards and parity prices on the local market, and our Flocks and Lambs, much to the advantage of growers and the Commonwealth, will gradually tend towards uniform standards of quality. In the meanwhile, we can do little more than set up an ideal, and individually aim to reach as near as possible to it.

6. Suitable Dams for Fat Lambs.

The quality and type of the Lamb will be affected by the inherited tendencies of both Sire and Dam and by the extent to which environmental conditions enable it rapidly to reach market ripeness. The ideal Dam for the purpose would from this point of view be one of the long wool British breeds available in Australia—Lincolns, Border-Leicester, English Leicester, or Romney-Marsh: but the farmer has to consider more than quality in the Lamb, namely, the full value of Flock revenues, of which the Dam's Fleece forms an important part: hence pure-bred Long Wools must be discarded as suitable Dams for Fat Lambs in the Commonwealth, because of relatively unprofitable fleeces, usual non-availability in the commercial sense, and in many cases because of incomplete adaptability to local conditions. From the standpoint of export quality in the Lamb, we must place in second line Half-bred Long Wool Dams—Merino x Lincolns, Merino x Border-Leicesters, Merino x English-Leicesters, and Merino x Romney Marsh—with which can reasonably be included Corriedales, if commercially available. All Ewes of the above type should make admirable dams for Fat Lambs: all are reasonably prolific and less liable to parturition difficulties than Merinos in lamb to Rams of British Breeds; they are good mothers, well able to protect their offspring and to nurture them rapidly to market ripeness; they will carry Lambs readily as two-tooths; and, finally, when their period of usefulness as dams has been completed, they will fatten off without difficulty.

The value of the Fleeces of these half-bred Ewes relatively to those of Merinos must necessarily vary with market demands at the time of sale: but, in the vast majority of cases, Merino wool, not excluding "shabby" farm wool, has on a per-pound basis had the advantage over cross-bred wool. From the viewpoint of "fleece values," however, weight of fleece is as important as value per pound: and in the latter connection, whilst Merino Ewes are frequently found carrying even heavier fleeces than average cross-bred Ewes, the strain of adequately rearing a lusty half-bred Lamb tells heavily on the fleece weight of the Merino Ewe, with the result that not infrequently a half-bred Ewe mothering twins will yield a heavier fleece than a Merino Ewe suckling a single half-bred Lamb.

The relationship of Fleece values was among other things worked out in detail by Messrs. Colebatch and Scott in their admirable report on Fat Lamb tests conducted at the Roseworthy Agricultural College (1924-26)*: figures given below show some of their findings on the subject, together with corresponding figures for present-day prices:—

	Mean	Values—					
	Fleece	Per Lb.		Total.			
	Weights.	1924-26.	1931.	1924-26		1931.	
	lbs.	d.	d.	s.	d.	s.	d.
Merino	11	18.55	8.45	17	0	7	9
Merino x Lincoln	12	14.67	6.92	14	8	6	11
Merino x English-Leicester ..	10½	16.38	7.43	14	4	6	6
Merino x Border-Leicester ..	10¾	15.72	7.26	14	1	6	6
Merino x Romney-Marsh . ..	11	15.55	7.18	14	3	6	7

Fleece values shown for 1924-26 may possibly make sheep-breeders' mouths water; but, coming down to present-day hard realities, the difference between these Roseworthy Merino and Cross-bred Fleeces respectively would on present-day values have varied between 9d. and 1s. 3d. per Ewe in favor of the Merino, a difference which the normal sale of Fat Lambs of higher grade would readily have made good. Nor should the fact be overlooked that data given are those of a small, carefully tended Flock under experimental test, and that under average farm conditions it is by no means certain that Merinos would be able to retain to an equal degree their apparent fleece value superiority: when times are hard cross-breds are the better foragers.

From these various considerations it can, I think, be safely accepted that a well managed Flock of half-bred Ewes should under existing local conditions not only give our nearest approach to the ideal export lamb, but in addition should on the balance return to the farmer the highest gross Flock Revenue that the times admitted. But, notwithstanding these outstanding advantages, there is one important fact which in existing circumstances does definitely preclude the general use of Ewes of this type on Australian Farms, namely, the usual impossibility of securing them when wanted, in adequate numbers and at right prices. It is true that it is sometimes stated that when such is the case farmers should breed their own Cross-bred Ewes: and whilst in special circumstances this could no doubt be done, for everyday purposes there are serious technical and economic objections

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*See Journal *of Agriculture,* 1927 (September, October, November, and December numbers), "An investigation into certain aspects of Fat Lamb Production on Agricultural Holdings," by W. J. Colebatch and R. C. Scott.

to the practice. The main objection is probably the fact that to rear Cross-bred Ewes on a farm, when the ultimate economic objective was the sale of Fat Lambs, would render unavoidable the simultaneous presence on the Farm of small groups of Sheep of various grades, and this on the average farm would only lead to confusion and pecuniary loss.

In order to illustrate the position I shall take the concrete case of a farm able normally to carry 500 Breeding Ewes throughout the year with the help of a certain amount of hand-feeding over Autumn and early Winter. Such a farm would require about 200 Merino Ewes, which would be purchased according to needs, in order to supply sufficient Ewe Lambs by a Long Wool Ram to provide for the regular renewal of the Cross-bred Flock every fourth year: allowing for normal casualties, say about 85 Lambs per annum. Corresponding wether Lambs would not be ideal freezers and would probably be marketed locally.

The 300 Cross-bred Ewes would include 85 Maidens, which would not drop Lambs until the following season: this would represent a loss in revenue to the farmer which would not be balanced by the slightly improved value of their Fleeces.

In addition, such a Farm would have to carry five to six Long Wool and five to six Short Wool Rams.

From the Revenue standpoint the net result would be as follows:—Instead of a single line of Wool, of useful size from a sale's viewpoint, there would be three undesirably small lots of Merino, Cross-bred, and Cross-bred Lamb's Wool: and instead of a possible 425 Lambs of a freezer type there would be 85 half-bred Long Wool Wether Lambs and 183 Short Wool freezers.

Apart from these normal economic disadvantages, I am of the opinion that the multiplicity of grades can lead only to confusion and additional loss on the average farm, which as a rule does not provide facilities for the handling of more than one grade of Sheep at a time. It follows, therefore, that for the time being at all events, notwithstanding some obvious disadvantages, we shall have to content ourselves with Merino Ewes as Dams to the Fat Lambs of our average farms: and for the purpose none are better than the large frame, plain bodied Northern Merinos, in any district to which they can accommodate themselves.

The advantages and disadvantages of Merinos as Dams to Fat Lambs respectively may be summarised briefly as follows:—

Their main advantage is that as essentially the Sheep of the country they are usually available in almost unlimited numbers when required. They have readily ascertainable market values, nor, apart from temporary or exceptional circumstances, such as the breaking up of a period of drought, is there any call to pay fancy prices for them. Under careful management they may be counted upon for fleece-values at least as great, and generally greater, than those of any other Breed or Cross. They are hardy under our special conditions of climate, and will find themselves at home in almost any district, but particularly so in Mallee districts, except in localities in which underfoot conditions are exceptionally wet. And, finally, they are usually conscientious respectors of even moderately Sheep-proof fences.

Their natural timidity, particularly if Station-bred, which makes them nervous, wary feeders under the comparatively boisterous conditions of a farm, may be accounted one of their disadvantages which, however, gentle handling should overcome in the course of a season. In comparison with that of British Breeds and their Crosses, the fertility of Merinos is relatively low: they rarely carry twins, but when they happen to do so, both in the interest of the Dam's Fleece and the Fat Lamb, it is desirable to destroy one of the Lambs, or else to foster it upon a Ewe that had lost her lamb. Merino Ewes are not usually good mothers, both in the sense of a frequently inadequate milk supply and of that of relative carelessness of their young: when herded in large flocks, or unduly harried, they frequently lose their Lambs in the early weeks of the life of the latter. Finally, when their period of usefulness as breeders has been completed, they do not fatten off as readily as cross-breds, nor when occasion arises for it do they prove as amenable to hand-feeding as the latter.

Such as they are, however, we have no alternative at present but to accept Merinos as Dams to farm-bred Fat Lambs: and it may be added that when suitably mated and adequately tended they are quite able to rear satisfactory Export Lambs.

When purchasing Merino Ewes for farm purposes, six-tooths which should yield at least two crops of Lambs will probably prove the most profitable. Maiden four-tooths should generally be avoided because of parturition difficulties when mated with Rams of British Breeds. Two-tooth Ewes are undesirable for the same reason, and in addition because unless dropped early in the year, say February, and able to make strong development before wet, cold conditions set in, Merinos will carry Lambs at this age only exceptionally. Sound, full-mouth Ewes can also be acquired, on the understanding, however, that only those with sound mouths at shearing time should be retained for a second lambing.

7. Appropriate Rams for Fat Lamb Flocks.

From the standpoint of Export type the utmost importance that attaches to an appropriate choice of Sires for Fat Lamb Flocks, and particularly so when the Dams are Merinos, cannot be too strongly stressed. In this connection there are three special characteristics which we expect the Fat Lamb Sire to impress upon his progeny, namely, (1) early maturity, (2) good bodily conformation, and (3) high quality flesh: and it follows that not only must these characteristics be highly developed in the Sires used, but in addition the latter should belong to Breeds noted for a high degree of prepotency in these special characteristics, that is to say, the power of stamping them upon their progeny, notwithstanding opposing tendencies on the part of the Dams. Prepotency in pure Breeds of Live Stock is usually the result of careful breeding along definite lines, extending over a large number of generations, assisted at times by the judicious use of in-breeding: hence, subject to the above considerations, the older a pure Breed of Live Stock, the greater its power of transmitting intact within the Breed its racial characteristics, and of imposing them to a large degree upon crosses with other Breeds. The Merino—one of the oldest Pure Breeds of Sheep in the World—is correspondingly prepotent, but only in the matter of fleece upon which the attention of Breeders has been concentrated for centuries: carcass development, on the other hand—so essential a point in the ideal Export Lamb—has been for the most part overlooked in the Merino except to the extent of making adequate provision of a surface upon which fine Wool could be suitably grown. Hence, from the standpoint of Meat production the Merino carcass may be said to be highly defective: it is relatively long, narrow, flat-ribbed, high in the withers, very irregular in top and bottom outline, with poorly developed legs of mutton and coarse bone: the characteristic carcass of one who has had to wander far and wide for a living. In addition, the Merino is a typical natural, or late-maturing Breed. It must be obvious, therefore, that if from Merino Ewes we are to produce early maturing shapely Fat Lambs, the Sires used must be highly prepotent in these special qualities. And for the purpose no more suitable Rams could be found than well-bred Southdowns: they belong to the oldest, and therefore the most prepotent, of British Down Breeds, to which indeed the later developed Down Breeds owe their more recent improvement by early crosses. From our point of view Southdowns present the additional advantage of being on the small side, and as such, leading to a minimum of parturition troubles, which are common when Merinos are mated with the larger British Breeds. The smaller size of the Cross-bred Southdown Lamb is an additional advantage from the standpoint of present-day requirements of British Markets. Nor should it be forgotten that the World-famed Canterbury Lambs are for the most part sired by Southdown Rams.

But unfortunately the number of Southdown Studs in Australia is limited, and their combined output is very far below the requirements of Australian Fat Lamb raisers, present and future. Hence, when Southdowns are not available, we shall have to fall back upon other Down Breeds locally available, namely, in order of merit, Suffolks, Shropshires, and Hampshires, the last two of which are apt at times to give rise to parturition troubles owing to the large size of the heads of the Lambs. When the Down Breeds are exhausted, again, in order of merit, there are the white-faced Ryelands, a well proportioned Breed recently introduced into the State; the Dorset Horns of exceptional early maturity, but over-developed on the fore-quarters, and under-developed in the hind quarters; and finally, the English-Leicester, whose only defect is a tendency to tallowiness in the mutton.

I have made no mention of Corriedales as possible Sires for Fat Lambs of export standard because, notwithstanding the admitted value of the Ewes as Dams in the same connection, Corriedale Rams in my opinion are quite unsuited for the purpose, and particularly so when mated back to Merinos. A breed of comparatively recent origin, in which an attempt has been made to combine the opposing qualities of Merinos and British Long Wools, Corriedales lack essential prepotency in the things that matter to the raiser of export Lambs; they are insufficiently early maturing and fall far short of the ideal in the matter of bodily conformation.

Although it is difficult to believe, and I trust that it may not be very common, I have heard it stated that on some farms cross-bred or mongrel Rams are being used as Sires for Fat Lambs. In the circumstances I feel it incumbent upon me to state that should such a practice become at all general, it would definitely destroy any chances we may have of building up a successful Export trade in Fat Lambs. Is it necessary to stress the fact that a cross-bred or mongrel Sire is quite without prepotency, that however attractive his outward appearance no dependence can be placed upon his issue, that his hereditary endowment is a medley of warring tendencies from which almost anything might be expected except an acceptable export Lamb? If, as may happen at times, suitable Rams are not procurable, in such circumstances the would-be Fat Lamb raiser should hold his hand, and for the time being fall back upon Merino Rams, which would be replaced by more suitable Sires in ensuing seasons.

8. Size of the Fat Lamb Flock in Relation to the Normal Farm Grazing Area.

The relationship of the size of the Flock to that of the available grazing area must necessarily vary with districts and with farms: and in my opinion it is upon the accuracy with which this relationship is determined that the probabilities of financial success in the venture very largely rest. Everybody realises the danger of over-stocking, but neither can the farmer afford to see his grazing area under-stocked: I admit, however, that of the two the former is more dangerous than the latter. In this connection it is necessary to stress the fact that "over-stocking," as understood on a Station property, has not the same meaning when applied to a farm. A Station property may be said to be over-stocked when the mean number of Sheep present throughout the year is in excess of its recognised normal carrying capacity taking both good and bad years into consideration: and as such a property generally depends very largely upon edible bush for reserves, the latter is destroyed in years of over-stocking, and the Capital value of the property is proportionally depreciated, apart altogether from losses of Sheep from starvation. On an average Farm the position is very different: there is no edible bush unless an important area of non-arable land be attached to the farm, which is unusual in Mallee country; the grazing area available consists for the most part of land temporarily out of cultivation, which may carry spontaneous edible weed growth, or be partly sown to special grazing crops; of short-term pastures such as Lucerne; and of stubbles of harvested crops. Finally, no farmer can expect to take full advantage of his grazing area who does not make provision for hand-feeding over the Autumn and early Winter days, a period which, according to seasons, should not as a rule exceed more than two to eight weeks. Hence a correct determination of economically adequate stocking of an average farm should be based upon an accurate estimate of the normal carrying capacity of the various types of grazing usually available, coupled with moderate use of hand-feeding.

When I said that no farmer could afford to under-stock his holding I had in mind the question I touched upon in my opening remarks, namely, that as soon as land temporarily out of cultivation on a farm is recognised as a grazing area for revenue-earning Live Stock, all overhead charges attaching to this area, together with costs of grazing crops, must be debited against Depasturing Live Stock Accounts: and when in such circumstances the grazing area is under-stocked these combined charges raise costs per unit to such a height as to preclude any possibility of profit balances.

I propose illustrating this point briefly from the Accounts of the Mallee Farm to which reference was made in my opening remarks. During two consecutive seasons the mean number of Sheep, inclusive of Lambs, carried by this farm, was represented by 520 head per annum; and the mean grazing area on a basis of 12 months availability by 868½ acres, on which was depastured the equivalent of about half Sheep per acre per annum. Mean Flock Expenditure per annum was as follows:—

	Mean Expenditure per Annum—							
	Per Flock.						Per Sheep (including Lambs).	
	£	s.	d.	£	s.	d.	s.	d.
Natural Pasture	72	4	1					
Grazing Crops (excluding Depreciation).	235	13	3					
General Expenses (excluding Depreciation)	25	3	6					
Depreciation on Improvements and Plant	68	6	1					
Interest on Working Capital	41	19	10					
Rates and Taxes	10	8	9					
				453	15	6	17	5
All other Costs				127	5	4	4	11
Total Costs				£581	0	10	22	4

The above statement shows that on this farm mean yearly flock expenditure was £581 0s. 10d., or 22s. 4d. per head, including Lambs. If, for purposes of argument, we assumed that the grazing area had been understocked, and that instead of half a Sheep to the acre it could have carried three-quarters of a Sheep, this would have meant that flock numbers could have been increased by 50 per cent. and represented by 780 head instead of 520. In such circumstances there is no reason why the six items of expenditure given separately and aggregating £453 15s. 6d. should have varied to any appreciable degree, and costs per Sheep under this heading would have been reduced from 17s. 5d. to 11s. 7d. It is probable, too, that 4s. 11d. per head for all other costs would have been reduced in a larger flock, but as such a reduction could be determined by arbitrary estimate only, we shall not take it into account, and merely state that had the grazing area carried three-quarters of a Sheep per acre per annum instead of half, costs of upkeep of the flock would have been reduced by 5s. 10d. per annum: these facts justify my statement to the effect that whilst a farmer should beware of over-stocking his farm he cannot afford to under-stock it.

At this stage, with your permission, I propose looking backward and making brief reference to an Address on a similar subject which I delivered before Congress in 1913. The Address was entitled "The Sheep Carrying Capacity of a Lower North Farm—A Record of Seven Years' Work."* I was at the time Principal of the Roseworthy Agricultural College, and had during the seven years referred to—1906-1913—kept a careful record of all Live Stock depastured on the fields of the College Farm. It was my purpose then, as it is to-day, to persuade farmers to make more adequate use of Live Stock on their Wheat Farms, and towards that end I made use of the College records to show what could be done at the time in that direction.

In the course of this Address I showed, among other things, that the College mean Farm area—1,534 acres—had been allocated during these seven successive seasons as follows:—

	Mean Areas. Acres.
Under Harvested Crops	599
Treated as Bare Fallow	474
Under Forage Crops	149
Grazing land temporarily out of cultivation	312
Mean Farm Area	1,534

Between 1906 and 1913—a period of seven years—the mean number of Sheep, including Lambs, depastured on this area was 1,370 head per annum, that is to say, close upon 9/10th of a sheep per acre per annum on the whole farm area. If to this we add Cattle and Horses, which also had access to our grazing areas, it can be said that a farm on which over 70 per cent. of the area was under Harvested Crops or Bare Fallow, averaged during a period of seven seasons the equivalent of one Sheep per acre per annum on the whole area of the Farm. Nor can it be said that we were over-stocked, and that in consequence the Farm Flock must have been in poor condition: in those years the College was a frequent prize-taker with Sheep at the Royal Agricultural Society's Shows; its Lambs were usually sold on the farm at the highest rates current at the time; nor can I recollect the average fleece weight having been less than 10lbs. per head; all of which argues good, and not bad, condition. Finally, hand-feeding was not availed of excessively or uneconomically. In three out of the seven seasons April and May rains were sufficiently abundant to render hand-feeding unnecessary: in three others rainfall distribution was less favorable, and in April and May the flock was provided with Cocky Chaff and straw, to which molasses were usually added. In one season only—1912-13—seasonal conditions were such as to render more intense hand-feeding necessary. The number of Sheep present on the farm at the time was 1,254, and the total costs of hand-feeding £279 0s. 5d., or 4s. 5d. a head: gross receipts for the year, on the other hand, aggregated £960 13s. 4d., or 15s. 4d. per head: such costs cannot be looked upon as prohibitive, even at shorter intervals than once in seven years.

If I have quoted these figures at all, it is in the main because the College Farm is situated in Mallee country, and that in virgin condition, its land, like that of most Mallee country, would not have supported half a Sheep to the acre. I wish, therefore, to stress the fact that the secret of its acquired heavy Sheep carrying capacity is to be found in the residual influence of heavy dressings of phosphatic fertilisers systematically applied to harvested crops over a long period of years.

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*Vide *Journal of Agriculture*, October, 1913, pages 364-390.

In this connection it should be stated that the College Farm was originally a small 600-acre farm, and that it has been gradually enlarged by successive purchases of adjoining areas: and it follows that the more recent purchases had not in my time been sufficiently long under the influence of heavy phosphatic dressings to show marked improvement in Sheep carrying capacity. Indeed, as a matter of close personal observation, I came to the conclusion at the time that from a grazing point of view our land out of cultivation was not at its best until it had carried at least 10 cereal crops dressed at the rate of 2cwt. of Superphosphate to the acre; that is to say, until it came under the residual influence of phosphatic dressings aggregating not less than one ton to the acre.

All Mallee areas are characteristically deficient in available soil phosphates, and this is particularly the case of the Murray Mallee Statistical Division generally. In the latter connection it will probably be recalled by some that the opening up of the original four hundreds for agricultural settlement was opposed by men who had had experience of the country under Station conditions on the grounds that whilst it was possible to fatten wethers on this country, it was not possible to rear Lambs or other young stock satisfactorily: this, as we know, can be accepted as practical confirmation of phosphate deficiency. It is fairly obvious to-day that high Sheep carrying capacity such as I have indicated for Roseworthy cannot be expected in relatively new Mallee areas until they shall have become very adequately dressed with phosphates in the course of normal cropping. If my Roseworthy experience in the matter holds good for other Mallee areas, namely, that maximum grazing results could not be anticipated until the pastures had had the advantage of the residual value of phosphatic dressings equivalent to one ton to the acre, then with the low dressings in current use, and intervals of three to four years between harvested crops, maximum grazing results are likely to be unduly protracted. Fortunately, since my Roseworthy days, we have found a shorter cut to the final goal, and that is systematic top-dressing of land temporarily out of cultivation and heavy dressing of specially sown grazing crops. I am aware that the latter practice involves out of pocket expenditure which cannot always be met nowadays: and the best that can be said in the matter is that in the interest of future profits grazing land should be top-dressed to the extent that personal means permit.

The grazing capacity of the Murray Mallee Farm that we have had under consideration appears to me to have been unusually low, as the following details will help to show:—

	Areas on basis of 12 months' availability. Acres.	Equivalent No. of Sheep per acre per annum. No.
Grazing Crop of Oats	489.5	0.52
Cereal Stubbles	134.5	0.61
Land out of Cultivation	244.5	0.47
Total Grazing Area	868.5	0.52

Of these figures, the most disappointing is the low grazing value—0.52 Sheep per acre per annum—of a more or less costly crop of Oats: one would have expected that at the very least a grazing crop of Oats would have supported the equivalent of one Sheep per acre per annum. The mean cost of this grazing Crop was £227 13s. 8d., including £68 10s. 8d. for the rental value of the land, and in the circumstances it would almost seem that better general grazing results would have been secured, and certainly more lasting improvement in the land, if £160 had been spent in Superphosphate for top-dressing purposes, instead of attempting to put in a grazing crop of Oats that could do no better than carry half a Sheep to the acre.

Corresponding results on the Roseworthy Farm quoted in my 1913 Address were as follows:—

	Equivalent Sheep per acre per annum.
Ordinary Pasture	1.51
Stubble Grazing	0.52
Fallow Grazing	0.25
Rape	1.86
Kale	2.46
Turnip	2.43
Vetches	2.25
Pease	2.34

There is one feature on the Mallee Farm we have had under review, a feature common in fact to all Mallee Farms, that have not yet been standardised for the intensive handling of Sheep on relatively small areas, namely, the large size of the grazing fields, which has probably exercised a limiting influence on the Sheep carrying capacity of the Farm. This farm has been exceptionally well laid out into 12 fields of the following areas:—238, 201, 160, 154, 146, 122, 121, 120, 115, 115, 84, and 79 acres. Now it is quite possible that to those without experience of handling Sheep on small areas the sizes of these fields may seem reasonable enough, not only for cropping, but for the handling of livestock as well: nevertheless, it can be stated most emphatically that apart from the use of numbers altogether out of proportion to the normal carrying capacity of the Farm, 10 out of these 12 fields are too large to make best use of moderately well grown natural pasture; and that all are too large, and some of them far too large, to make even moderate use of a well grown forage crop. The ideal in such matters is to feed off heavily and rapidly and change flocks frequently from field to field: such changes are in the interests not only of the pasture or the forage crop, but in the interests of the general health of the flock as well. Large fields and inadequate flocks lead to costly waste of feed in the growing period, and inadequate reserves for the dry times of the year. No farm is likely to be stocked up to its maximum carrying capacity until its largest field is reduced to 50 acres in area, and many fields of 20 acres are available. I realise that small fields mean increased capital expenditure, particularly as adequate provision for water has to be made in each of them: in present times, therefore, I shall not insist on the matter, but merely point to the advantages of increased subdivision and suggest that when permanent fencing is impossible light, temporary fences can be used. If in this connection I might quote my own experience I can say that at Roseworthy I succeeded in practically doubling the carrying capacity of a 120-acre field by dividing it into four fields of approximately equal areas.

I have perhaps laid myself open to the reproach that in spite of a lot of beating about the bush I have not yet stated plainly what should, in my opinion, be the size of a flock on an average Mallee Farm: nor, as a matter of fact, do I intend committing myself to any such statement. I know too well how much climate, soil, and economic conditions differ on almost every farm, and that what is possible on one is not always possible on another. I shall, however, venture a general statement in these terms: I believe that with the assistance of heavier phosphatic dressings to harvested crops, of pasture top-dressing, of judiciously chosen and handled forage crops, of occasional and seasonal hand-feeding, and finally of rational tending of the flock, it should eventually be possible for the average Mallee Farm to carry a sheep to the acre on the total area available for Grazing, including Forage Crops, without appreciable reduction in the area normally allotted to Wheat.

9. SUMMARISED STATEMENT OF MANAGEMENT.

Although I have neither the time nor the intention of writing a complete treatise on the handling and management of a Fat Lamb Flock, I propose, before closing my remarks, to summarise in as few words as possible the main points in management that have not already been broached.

At shearing time all Ewes should be carefully "Mouthed," and those with unsound mouths branded and fattened off shears: feet, too, should be examined and trimmed if necessary: Merinos in particular show long hoof growth in soft country. Dry ewes that had lost their Lambs or never were in lamb should be specially marked, and if dry two seasons in succession should be fattened off shears. Shorn ewes should be placed on good feed in order to promote rapid recovery from the strain of rearing lambs: they should be dipped four to six weeks after shearing, subsequent to which late lambs and all that had not hitherto proved marketable should be weaned, shorn, placed on specially good feed, and sold as soon as marketable. When, however, feed was in excess of the ewes' requirements and market conditions warranted it, late lambs could be marketed to advantage as late as February or March: but all should be off the farm before the succeeding season's lambing. Between shearing and mating time, ewes should have had ample time to acquire good store or half-fat condition. Mating time should be so arranged that the bulk of the lambs fall at a time when green feed was normally present in the locality, that is to say, within five months of mating. Over the greater portion of the State, and particularly in the Mallee, lambs should be made to drop in late Autumn and early Winter, say, between mid-April and the end of June, according to districts: February and March, however, are preferable for Merinos, when it is possible to provide the dams with green feed. Hence, rams should be brought into the flock some time in November: for every 100 ewes there should be not less than three rams of British Breeds, although two Merino rams will usually suffice. Rams of British Breeds are rarely satisfactory lamb-getters after the third season, and should generally be replaced. Ewes should be yarded at night once or twice a week during mating time, and it will not come amiss to keep back one or two spare rams until the third or fourth week of mating. Rams should be removed from the flock in six to eight weeks' time and placed in a special ram paddock in which they should be fed adequqately but not allowed to get too fat. At this stage the flock should be given a second dipping, chiefly as a protection against lice.

Stubbles will be available in January, and normal grazing areas can be spelled; here the ewes will do well for a few weeks provided they have constant access to plenty of good, clean water: drinking troughs are quickly soiled by sheep and should be cleaned out once a week. Towards the closing weeks of gestation the ewes require plenty of gentle exercise if parturition troubles are to be avoided: hence, occasional visits to the fallows will not come amiss provided they be not over-done. The flock should be visited periodically for fly troubles, and fly struck ewes should be treated as early as possible: the whole flock should be crutched closely prior to lambing, every precaution being taken to avoid damaging ewes heavy in lamb: they should be handled with the greatest care and not crushed unduly in the pens nor harried by dogs.

March and April will usually be critical months, during the course of which hand-feeding will be more or less necessary. Hand-feeding should not be delayed until all feed has been consumed: with sufficient roughage a pound or two of Oats a head per day should suffice: in the first week half-allowance only should be fed mixed with good Cocky Chaff. Self-feeders are best for the purpose; in their absence adequate substitutes must be devised. All ewes should reach lambing time in good condition, but not too fat. Baits for foxes should be scattered in February and March: roamers should be destroyed before lambs begin to drop.

Ewes should lamb in well sheltered paddocks, preferably in flocks of not more than 100: in large flocks they are apt to lose their lambs wholly or for undesirably long intervals: they should be protected against disturbances likely to intimidate them, otherwise Merinos tend to abandon their lambs. Lambs are dropped chiefly in the evening or early morning: hence lambing flocks should be visited twice daily. Apart from diseased conditions, parturition troubles are not usual with sheep: they are more frequent in dry than in moist conditions of weather. Merinos require assistance at times when dropping lambs to Large British Breeds.

Lambs will nibble young grass a few days after birth: and when green feed is scarce, ewes that have lambed should be separated daily from the flock and placed on specially reserved feed. At birth lambs will weigh from 1/10th to 1/12th of the weight of their dams, say 7lbs. to 10lbs. for smaller breeds and 12lbs. to 18lbs. for larger breeds: they should increase in weight at the average rate of ½lb. a day, and with good mothers even more. To some extent weather controls development: continuous wet weather retards it: given sufficiency of feed, bright, frosty weather puts on bloom.

Lambs should be tailed, and males castrated within two to three weeks of birth: if practised later, development is retarded. The lambing flock should always be kept upon good forcing feed; and carefully tended cross-bred lambs should be ready for market 3½ to 4½ months from birth: they should be handled with the utmost care for fear of bruises.

CONCLUSION.

In my opening remarks I stated that the title of my address was to some extent misleading, and that whilst I had undertaken to discuss Sheep in the Mallee, the main object at the back of my mind was to stress the extreme importance to Farmers of the State of what has come to be known among us as the side-lines of a Wheat Farm. And now I must confess that I do not know whether in attempting to do two things at once I have not fallen between two stools. After many years of careful observation, my own personal conclusion is that whatever the circumstances, and whatever the prices obtaining at the time, no Wheat Farmer in Australia can afford to overlook the assistance to be derived from Dairy Cattle, Sheep, Pigs, or Poultry, singly, or taken in the aggregate. In the difficult economic struggle of the nineties this fact was very clearly driven home to South Australian Farmers of that time: and it is in my opinion much to be regretted that a series of favorable seasons coupled with unusually high prices for Wheat should have made their post-war successors forget the painful lessons of the past. It should be obvious that no farmer can afford to lay out his plans on the basis of high Wheat prices any more than he can afford to do so on the basis of the permanency of favorable seasons: rather should he in either matter be guided by the golden mean and adhere to plans that have stood the test of time. Let us hope, therefore, that when once again our Farm Flocks and Herds shall have been successfully built up, history will not repeat itself, and that we shall not see invaluable Live Stock sent into exile and a return to the one-crop ideal.

In conclusion, I shall say that during the course of my remarks I have had to express personal opinions, fairly forcibly at times, perhaps, and, as is the way in matters human, there will be those who hold quite opposite views. In this connection I shall say, therefore, that when I am called upon to tender public as distinct from individual advice on technical matters, I ask myself two questions, namely:—(1) What is best from the viewpoint of the State as a whole? and (2) What is best from the viewpoint of the *average* farmer? and according to my lights I endeavor to act accordingly. It follows, therefore, that at times I must miss the viewpoint of the man of exceptional experience; but he, as we all know, is generally able to look after himself.

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ANNUAL REPORT ON PASTURE IMPROVEMENT, KYBYBOLITE EXPERIMENTAL FARM, 1931-32.

[By L. J. Cook, R.D.A., Manager.]

(*Continued from page* 265.)

The Breeding of English Leicester-Merino Lambs on Subterranean Clover and Wimmera Rye Grass Pasture.

For the past three seasons separate flocks of ewes have been grazed on the different series of fertilised plots, and careful records kept of the lambs produced. Flock E, consisting of 31 aged ewes, 20 maiden ewes, and 15 hogget ewes, was used on Plots Nos. 4, 5, 6, and 15 fertilised with superphosphate.

Flock I, consisting of 25 aged, 17 maiden, and 13 hogget ewes, was used on Plots Nos. 3, 7, and 8, fertilised with lime or gypsum and superphosphate. Flock G, consisting of 21 aged, 14 maiden, and 11 hogget ewes, was used on Plots Nos. 10, 11, and 13 fertilised with rock phosphate; whilst Flock K was used on the balance of plots.

The following table shows the percentage of lambs marked, and the average weight of lambs at weaning, from the three Flocks E, I, and G, for the three years.

Table 9.—*Breeding of English Leicester-Merino Lambs,* 1929-32.

Flock.	Type of Fertiliser.	Type of Pasture Grazed.	Lambs Marked. Oct., 1929. %	Oct., 1930. %	Oct., 1931. %	Average Weight of Lambs at Weaning. Jan., 18th, 1930. Lbs.	Jan. 8th, 1931. Lbs.	Jan. 5th, 1932. Lbs.		Sheep Car. per Acre.
Aged ewes	Island Rock Phosphate	Subt. Clover and Rye Grass	111	144	114	74·1	57·2	52·3	Comebacks..	3·14
I Aged ewes	Super and Lime or Gypsum	Subt. Clover and Rye Grass	111	137	124	64·7	51·7	52·0		4·73
E Aged ewes	Superphosphate	Subt. Clover and Rye Grass	90	137	106½	61·2	54·4	50·8		4·18
E Maiden ewes ...	Superphosphate	Subt. Clover and Rye Grass	—	...	80	—	—	61·9	Crossbreds ..	4·13
G Maiden ewes ...	Island Rock Phosphate	Subt. Clover and Rye Grass	—	—	69	—	—	64·1		3·14
I Maiden ewes ...	Super and Lime or Gypsum	Subt. Clover and Rye Grass	—	—	76½	—	—	67·0		4·73
KI Maiden ewes ..	Super and Lime or Gypsum	Natural Pasture	—	—	50	—	—	57·3		2·93

All the aged ewes used in the above flocks were selected similar in type and age, Leicester-Merino half-breds, and were mated to Merino rams. The lambing percentages were again very satisfactory; the light percentage in E Flock during 1929 was due to an unusual number of deaths at birth.

The maiden ewes (1929) drop are daughters of the aged ewes, grazing on these plots, by Merino rams, and were this year mated with English Leicester rams. Their lambing percentages were very fair for maiden ewes, and they produced some very fine lambs, the average weight of which at weaning was somewhat lower than could have been expected, on account of the very early ripening of pastures, and consequent irritation of grass seeds.

KI Flock is constituted of similar ewes, but grazed on improved natural pasture, without Subterranean Clover or Rye grass. As could be expected, the lambing percentages and weight of lambs has been considerably lower in this flock.

The comparison of weights and percentages show clearly that the sown pasture on cultivated land is much preferable for breeding purposes than the natural pasture, even when the latter is well fertilised by top-dressing.

DEVELOPMENT OF COMEBACK EWES ON SUBTERRANEAN CLOVER AND WIMMERA RYE GRASS PASTURE.

The maiden ewes and hoggets in the above flocks have been grazed on their respective plots from birth (Spring 1929 and 1930 respectively), excepting for a few weeks at weaning and mating times, when they were run on similar type pasture, and to further show the advantages of cultivated pasture the following graph is of interest:—

Graph 5 shows the monthly weights of Comeback ewes (¾ Merino, ¼ English Leicester), born and reared on the cultivated pasture, compared with those reared on improved (top-dressed) natural pasture since May, 1930, and also the weights of similar ewes bred in 1930, and weighed from May, 1931.

The 12 ewes in KI Flock were originally bred on clover plots, but the four hoggets added in April, 1931, were bred on natural pasture.

All were selected similar in type, age, and breeding, weighings were made as regularly as possible, and similar treatment given to the four flocks throughout the seasons, they being all subject to our system of rotational grazing.

It is interesting to note that, although the 1929 ewes started in May, 1930, at a comparatively even weight, there was a considerable difference 12 months later, and this difference has been maintained throughout the next 12 months, despite the fact that the flocks on cultivated pasture reared 50 per cent. more lambs than those on uncultivated natural pasture, as shown in Table 9. The three former flocks for the past 12 months have been an average weight of 110lbs. per head, approximately 17lbs., or 18½ per cent. heavier than the latter, which has for the same period been an average weight of 93lbs. per head.

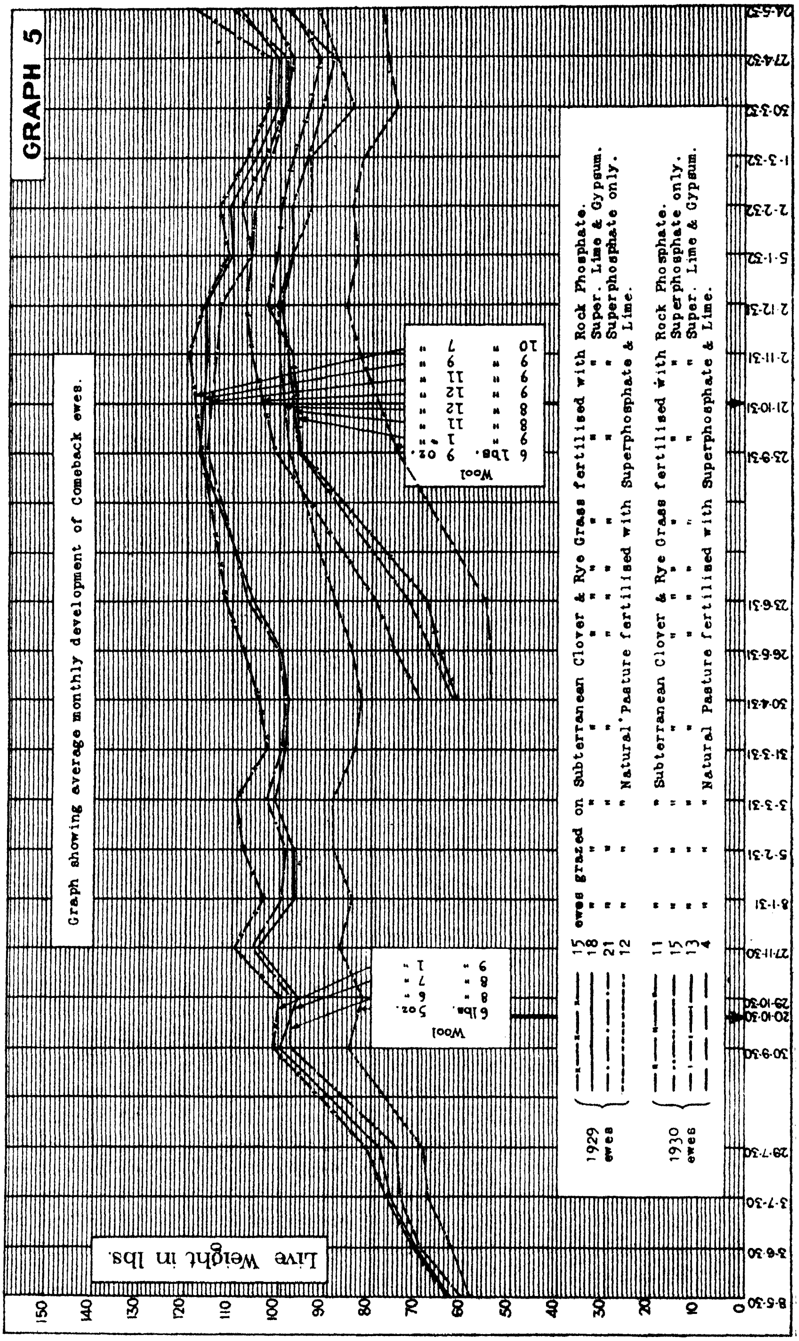
The weights of the 1930 ewes have shown a comparatively similar development as the 1929 ewes during the previous year. The 1930 ewes in KI Flock were bred on the natural pasture, and therefore at the commencement of weighing on April 30th, 1931, their average weight was somewhat below those of the other flocks. The graph shows that their weights have risen and fallen proportionately with the others, and there has been a regular difference of 22 per cent. in live weight.

The weight of wool produced from the different pastures is most marked. On the clover and rye grass the 1929 ewes have averaged 18lbs. 8ozs. wool for the two shearings, and the 1930 ewes have averaged 9lbs. 3ozs. for 1931 shearing. The ewes on improved natural pasture yielded respectively 15lbs. 1oz. and 6lbs. 9ozs. Increases in favor of sown pasture of 23 per cent. and 40 per cent.

If the graph of KI Flock is compared with those of Flocks B, C, and D shown in Graph 2 earlier in this article, a marked similarity in development and weights of wool is noticed, so that these graphs can be regarded as showing what can be expected as typical development on top-dressed natural pasture.

As regards the three Flocks G, I, and E, that have been fed wholly on Subterranean Clover and Wimmera Rye grass pasture variously fertilised, these have developed comparatively evenly, and although Flock G, grazed on pasture fertilised with rock phosphates, has been slightly in advance of the other two during most of the period the differences are not very marked. Compared with Flock I, grazed on pasture fertilised with lime and superphosphate, the difference in weights of ewes during their hogget period was 5lbs. to 6lbs. average, and during this year, their first breeding season, the difference has only been 2lbs. in live weight. The lambs produced favored I Flock, which marked 76½ per cent., against 69 per cent. by G Flock, and at weaning time I Flock lambs averaged 67lbs., against 64lbs. of those in G Flock. In wool production G Flock has produced 19lbs. 8ozs. wool per head, and I Flock 18lbs. wool per head in the two seasons.

E Flock, grazed on pasture fertilised only with superphosphate, has not varied in average live weight of ewes, more than 4lbs. per head compared with G Flock, produced 80 per cent. lambs, weighing 62lbs. each at weaning, and yielded 18lbs. 1oz. wool per head in the two seasons.



GRAPH 5

Graph showing average monthly development of Comeback ewes.

These differences are only slight, so that the actual carrying capacity of the various fertilised plots governs the productivity materially. Those dressed with lime and superphosphate have the greatest carrying capacity for the years under consideration, as shown in the final column of Table 9. These figures include all sheep carried for the whole season. The average number of ewes carried per acre for 1931-32 has been 4.10 for lime and super. plots, 3.50 for super. only plots, and 2.71 for rock phosphate plots.

Calculating from these it is found that the lime and super. plots have produced 39.2lbs. wool and 210lbs. live-weight lamb per acre; the super. only plots 33.9lbs. wool and 173lbs. lamb, and the rock phosphate plots 28.3lbs. wool and 120lbs. live lamb per acre.

With reference to the health of sheep in the above flocks, the losses during 1931-32 have been much greater than previous seasons, due almost entirely to entero-toxaemia, which affected the sheep during last winter, and early spring of the season. Of the 1929 ewes, two died during 1930-31, one in Flock E and one in Flock G, and three died during 1931-32, two in Flock I and one in Flock G. These are percentage losses of 3.7 per cent. and 5.9 per cent. in respective seasons.

Of the 1930 ewes the losses were greater, three deaths occurring in Flock I and one in Flock G, meaning a loss of 10.3 per cent. for the season of 1931-32. Against these, in the KI Flock, grazing on improved natural pasture there has been no losses during either season.

Assuming that the flocks were all composed of 1929 ewes, and allowing for losses, the top-dressed natural pasture has produced during the past 12 months 23.1lbs. wool and 76lbs. live lamb per acre, whilst the top-dressed sown pasture has produced 32lbs. wool and 160lbs. live lamb per acre. An increase of 38½ per cent. wool and 110½ per cent. live lamb in favor of the sown pasture.

Considering only the 1930 ewes, and allowing for losses, these young hoggets produced 29.03lbs. wool per acre on sown pasture, and 19.78lbs. on the natural pasture, an increase of 47 per cent. in favor of sown pasture.

SUBTERRANEAN CLOVER.

A number of comparatively large fields have been established for some years with Subterranean Clover, and a few with Wimmera Rye grass included. Manurial dressings have been phosphatic, and some of the fields have been limed in the past. The pastures in these fields have this season consisted mainly of Subterranean Clover and annual naturalised grasses, such as sterile brome, barley, and silver grasses. The grazing of fields has not been complete in every case, as a certain reserve of feed has necessarily been held back for April and May grazing, with a consequent loss of feed. However, the following table shows the grazing taken from these fields during the last eight years, and is of interest for comparison with other forms of pasture.

TABLE 10.—*Subterranean Clover, Grazing, Kybybolite,* 1924-32.

Season.	No. of Fields.	Area. Acres.	Total Feed Days.	Sheep per Acre.
1924-5	1	29·50	29,469	2·74
1925-6	3	109·00	100,794	2·53
1926-7	5	181·50	141,041	2·13
1927-8	6	231·80	208,635	2·47
1928-9	7	267·66	234,378	2·40
1929-30	7	263·71	220,071	2·29
1930-1	5	155·70	138,417	2·44
1931-2	7	237·40	238,234	2·74
Mean	—	1,476·27	1,311,039	2·43

The result from these pastures for this season, 2.74 sheep per acre, is well above the average, and equal to the best season recorded in the past, namely, 1924-5. This result is partly attributable to most fields being more completely grazed, and less held in reserve for the coming season. The average carrying capacity for the eight seasons is now close upon 2¼ sheep per acre per annum, and shows a useful and marked consistency.

Of individual fields under clover this season, Field No. 20, 35.86 acres, yielded the greatest return with 3.62 sheep, followed closely by Field No. 20C, 29.6 acres, with 3.45 sheep per acre, whilst the lowest return came from Field No. 20E, 29.6 acres, with 1.81 sheep.

RYE GRASSES AND ALSIKE CLOVER.

Trials with both Perennial and Italian Rye grasses with Alsike clover have been continued in the six-course rotation of 2 acre fields, and of recent years better results have been obtained from Perennial Rye than from the Italian. This season certified New Zealand Perennial Rye was sown, and germinated well, and made a very good stand, but the Alsike clover failed. The results of nine seasons are shown in the accompanying table.

TABLE 11.—*Grazing of Rye Grasses and Alsike Clover, Kybybolite,* 1923-32.

Field.	Season.	Area. Acres.	Total Feed Days.	Sheep per Acre.
No. 9F	1923–24	1·94	1,563	2·14
No. 9F	1924–25	1·94	1,414	2·00
No. 9E	1924–25	1·94	838	1·18
No. 9F	1925–26	1·94	792	1·12
No. 9E	1925–26	1·94	942	1·33
No. 9D	1925–26	1·94	696	0·98
No. 9D	1926–27	1·94	1,628	2·30
No. 9C	1926–27	1·94	1,037	1·47
No. 9C	1927-28	1·94	1,065	1·50
No. 9B	1927–28	1·94	444	0·63
No. 9C	1928–29	1·94	2,067	2·92
No. 9B	1928–29	1·94	1,210	1·71
No. 9A	1928–29	1·94	1,399	1·98
No. 9A	1929–30	1·94	863	1·22
No. 9F	1929–30	1·94	902	1·27
No. 9A	1930–31	1·94	2,444	3·45
No. 9F	1930–31	1·94	2,101	2·97
No. 9E	1930–31	1·94	2,156	3·05
No. 9D	1931–32	1·94	1,015	1·43
No. 9E	1931–32	1·94	1,863	2·62
No. 9F	1931–32	1·94	1,866	2·63
Total	—	40·74	28,305	1·90

The results from the series this season have been better than average. This is due to better stands of Rye grass, and to extra top-dressing with superphosphate, that has been given to the second year of pasture, causing a good growth of naturalised clovers. Alsike clover has been poor this season. In handling this pasture it has been treated as a temporary pasture of two, and in a few cases of three, seasons' duration. The average on its first year's grazing for nine seasons has been 1.57 sheep per acre, and on its second year's grazing for eight seasons its average has been 1.96 sheep. Four times it has been left for a third season, when its average has been 2.53 sheep per acre, showing an advantage in leaving the pasture for three seasons provided it is top-dressed.

It is proposed to discontinue the trial of Alsike clover, and sow the fields with a mixture of Perennial Rye grass, *Phalaris tuberosa,* White Dutch, and Subterranean clovers, during the next few seasons, and give the pasture a longer duration in the rotation.

TOP-DRESSING OLD CULTIVATED LAND.

For the past seven years fair areas of land that have been cultivated for a period of from 15 to 20 years have been left out of the cropping area, and to enhance their grazing, they have been top-dressed annually with 1cwt. superphosphate per acre, but no grasses or clovers have been sown. This has had the effect of greatly increasing the growths of naturalised grasses and clovers. The following table summarises the grazing received from this class of pasture each season:—

TABLE 12.—*Grazing of Top-dressed Old Cultivated Land, Kybybolite,* 1925-32.

Season.	No. of Fields.	Area. Acres.	Total Feed Days.	Sheep per Acre.
1925-26	1	50·00	30,097	1·65
1926–27	4	140·47	68,764	1·34
1927–28	3	102·47	76,196	2·04
1928-29	3	121·07	102,089	2·31
1929–30	4	151·83	144,242	2·60
1930-31	4	151·83	134,629	2·43
1931-32	4	151·83	123,491	2·22
Total	—	869·50	679,508	2·14

Similar land left out of cultivation, but not top-dressed, has during the past four seasons carried 1.23 sheep per acre.

As a comparison to the above, the following two tables are included to show the grazing received from similar land that has never been cultivated.

Table 13 shows the combined results of all such land that has been top-dressed, whilst Table 14 shows the results from a fair area of unimproved natural land—that is, land that has neither been cultivated nor top-dressed.

TABLE 13.—*Grazing of Improved Natural Land by Top-dressing only, Kybybolite,* 1921-32.

Season.	No. of Plots.	Area. Acres.	Total Feed Days.	Sheep per Acre.
1921-22	5	17·5	9,971	1·56
1922-23	5	17·5	9,458	1·48
1923-24	5	17·5	10,949	1·71
1924-25	6	21·0	21,859	2·85
1925-26	8	31·0	18,874	1·67
1926-27	11	43·0	28,948	1·84
1927-28	11	43·0	29,765	1·90
1928-29	11	43·0	38,880	2·48
1929-30	12	46·5	35,261	2·08
1930-31	12	46·5	47,900	2·82
1931-32	12	46·5	49,791	2·93
Total		373·0	301,656	2·21

TABLE 14.—*Grazing of Unimproved Natural Land, Kybybolite,* 1921-32.

Season.	No. of Plots.	Area. Acres.	Total Feed Days.	Sheep per Acre.
1921-22	2	116·5	33,324	0·78
1922-23	2	116·5	28,180	0·66
1923-24	2	116·5	17,343	0·41
1924-25	2	116·5	28,431	0·67
1925-26	3	88·5	23,711	0·73
1926-27	3	61·5	15,725	0·70
1927-28	3	44·5	16,887	1·04
1928-29	2	8·5	1,912	0·62
1929-30	5	19·0	5,407	0·78
1930-31	5	19·18	6,291	0·90
1931-32	4	15·68	5,392	0·94
Total	—	722·86	182,603	0·69

In summarising the grazing results of the Farm, the areas that have been subjected to the different treatments for a number of years are collected and averaged over the various periods in the following table:—

TABLE 15.—*Summary of Grazing Results at Kybybolite.*

Type of Grazing.	No. of Years Tested.	Area. Acres.	Sheep per Acre per Annum.	Increase over No Manure. Sheep.	Increase over No Manure. Per Cent.
Subt. Clover and Wimmera Rye Grass (Expl.)	7	70·5	3·23	2·54	368
Subt. Clover (Large fields)	8	184·53	2·43	1·74	252
Improved Natural Land (Topdressing only)	11	33·91	2·21	1·52	220
Topdressed old cultivated land	7	124·21	2·14	1·45	210
Rye Grass and Alsike Clover	9	4·52	1·90	1·21	175
Non-topdressed old cultivated land...	4	43·00	1·23	0·54	78
Natural Land (Unimproved)	11	65·71	0·69	—	—

The results in Table 15 can be looked upon as a fair comparison, although it must be noted that it has not been practical to fully graze all the larger fields, especially amongst those in items 2, 4, and 6. However, as they are averaged over a number of years, the table is useful and interesting, and continues to show the advantages to be gained from Subterranean clover, Wimmera Rye grass, and top-dressing with phosphates.

SOWN WINTER GRASSES.

Among the experiments more recently commenced, 5-acre plots were established in 1929 of Wimmera Rye grass, Perennial Rye grass, and *Phalaris minor*, by sowing 8lbs. seed per acre for the Ryes and 2lbs. *Phalaris* with 1cwt. 45 per cent. superphosphate.

In 1930 a plot of *Phalaris tuberosa* was established by using 2lbs. seed with 1cwt. 45 per cent. superphosphate per acre. This seed showed rather low germination test, but produced quite a good stand of plants, that have this season provided a wealth of feed especially during the winter months. Its yield of 3.52 sheep per acre is twice as good as any one of the other three grasses under similar treatment, and this, combined with its known ability to persist under local conditions, leads us to expect some valuable results from it in the future.

This season the four plots were again top-dressed with 1cwt. 45 per cent. super. and 3lbs. Subterranean clover seed were broadcasted per acre over the plots and covered by harrowing. The Rye grasses suffered during winter from the shortage of humus, or available nitrogen in the soil, and did not give nearly as much feed as during the previous season. The Wimmera Rye was somewhat better than the Perennial.

Table 16 shows yields from these grasses for the two seasons:—

TABLE 16.—*Grazing Sown Winter Grasses, Kybybolite,* 1930-32.

Area. Acres.	Variety.	Year Sown.	Sheep per Acre. 1930–31.	Sheep per Acre. 1931–32.	Mean.
5	Wimmera Rye Grass	1929	2·47	1·70	2·09
5	Perennial Rye Grass	1929	2·05	1·48	1·77
5	*Phalaris minor*	1929	1·86	1·81	1·84
5	*Phalaris tuberosa*	1930	1·64	3·52	2·58

KIKUYU GRASS.

A small trial plot of Kikuyu grass was established in virgin soil, by planting runners of the grass in plough furrows, with superphosphate, 4ft. apart, during September, 1929. The plants took a good hold of the soil, have spread over the whole plot, and have made plenty of growth during the warmer months of the year. It produces very quick feed after summer rains, but produces little or no feed during the cold months of the year, which detracts greatly from the value of the grass to the district. No grazing record of this plot is available.

NITROGEN FERTILISER TEST.

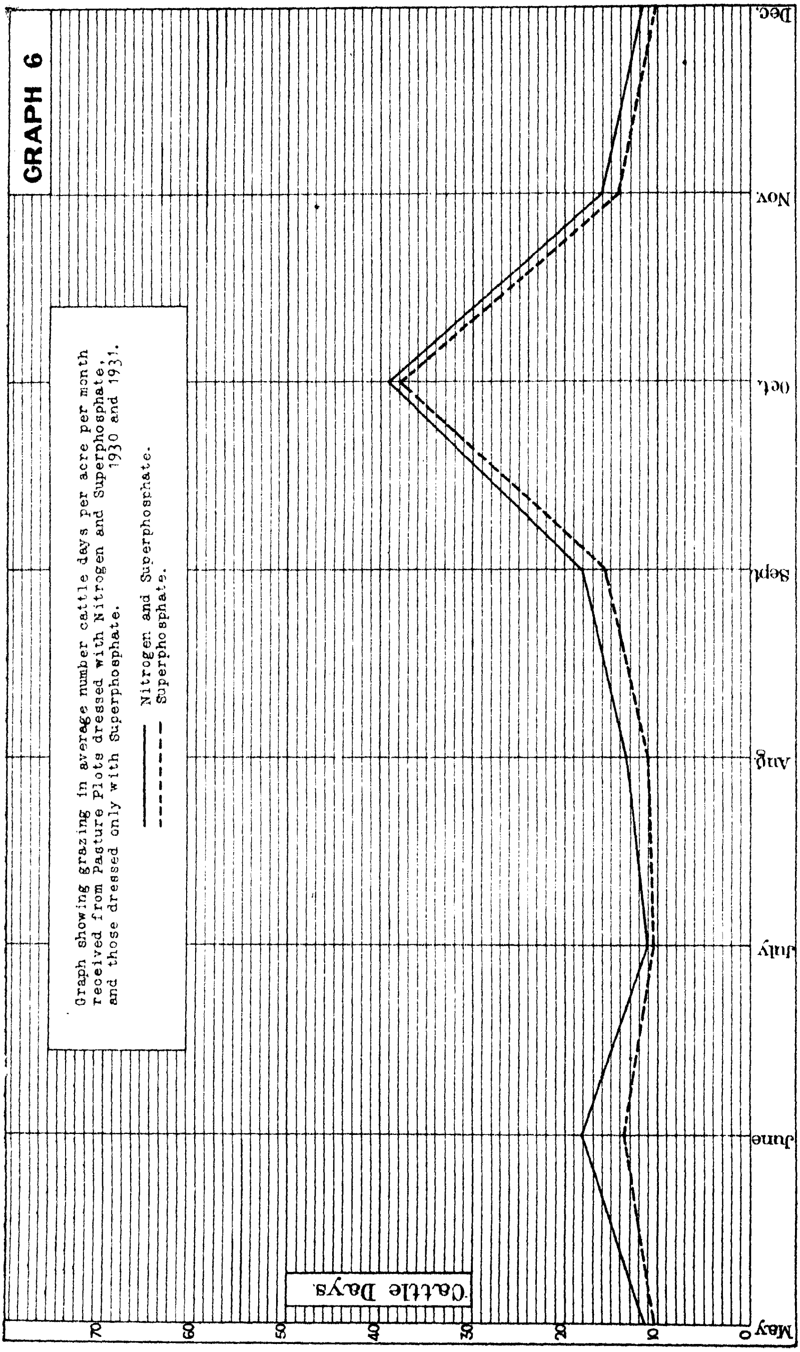
WORK was commenced in conjunction with the Nitrogen Fertilisers Proprietary Limited in 1929 to test the complete fertilisation of Subterranean clover and Wimmera Rye grass pasture, combined with intensive grazing by the milking herd. Eight 4-acre plots were established in 1930, four dressed with nitrogen as well as phosphatic fertiliser, and four alternate ones dressed only with phosphatic fertiliser.

All plots were top-dressed in May, 1930, and April, 1931. Grazing by the milking herd was commenced on June 21st, 1930, and on May 11th in 1931, and during the two seasons the plots were grazed in rotation, and complete grazing maintained. The Whakatane pasture harrows were put over the plots during August, 1930, June, 1931, and again in August, 1931. In 1930 feed was available for milkers until the second week of December, but this season this grazing was completed by November 22nd. Afterwards sheep and horses were used to completely clean up the plots. On account of the good February rains in 1932, a little grazing for the herd was available late in March. The Rye grass did comparatively well on most of these plots during this season. The following table shows the fertiliser applied on individual plots, together with the carrying capacity secured for the two seasons in cattle days per acre.

TABLE 17.—*Nitrogen Fertiliser Test on Subterranean Clover and Rye Grass*, 1930-32.

Plot.	Fertiliser per acre per annum.	Cattle days per acre. 1930–1.	1931–2.	Mean.	1930–2.
1	1cwt. 45% super. and 1cwt. 20% Sulphate of ammonia	0·59	0·47	0·53	0·48
3	1cwt. 45% super. and 1cwt. 20% Sulphate of ammonia on eastern half; 1cwt. 20% calcium nitrate on western half	0·41	0·34	0·38	
5	1cwt. 45% super. and 1cwt. 20% calcium nitrate	0·55	0·41	0·48	
7	1cwt. 45% super. and 2cwts. 20% Sulphate ammonia western half; 2cwts. 20% calcium nitrate eastern half	0·54	0·51	0·53	
2	1cwt. 45% super.	0·39	0·38	0·39	0·41
4	1cwt. 45% super.	0·42	0·25	0·34	
6	1cwt. 45% super.	0·51	0·33	0·42	
8	1cwt. 45% super.	0·52	0·43	0·48	

Table 17 shows an increase due to the nitrogen fertiliser applications of 0.07 cows per acre per annum. However, in considering the six growing months of the year, June to November inclusive, Graph 6 shows that the plots dressed with nitrogen and phosphate have produced 115.7 cattle days per acre each season, whilst those plots dressed with phosphate only have produced 102.7 cattle days per acre, an increase of 13 cattle days per acre for the growing period of each season. The graph shows that this advantage of nitrogen has been greatest during the winter months, a period of the year when increased feed is most valuable. The following table, No. 18, shows the monthly increase of cow days secured from June to November, together with the daily production of butter fat per cow during 1931, from which the monthly gain in butter fat is computed. The price per pound received at the Farm, and the value of the increase, is shown in the final columns.



GRAPH 6

Graph showing grazing in average number cattle days per acre per month received from Pasture Plots dressed with Nitrogen and Superphosphate, and those dressed only with Superphosphate. 1930 and 1931.

TABLE 18.—*Increased Production Due to Nitrogen Fertiliser.*

Month.	Increase of cow days per acre.	Daily butterfat production per cow.	Increase of butterfat per acre.	Price of butterfat.		Value of increase per acre.	
		Lbs.	Lbs.	*s.*	*d.*	*s.*	*d.*
June	4·4	1·11	4·88	1	0¾	5	2·2
July	0·7	1·10	0·77	1	0½	0	9·6
August	2·4	1·09	2·62	0	11¾	2	6·8
September	2·5	1·11	2·77	0	11¾	2	8 5
October	1·1	1·19	1·31	1	0¼	1	4
November	1·9	1·06	2·01	0	11½	1	11·1
Total	13·0	1·11	14·36	1	0	14	6

During the period the milking herd was fed a dry ration of hay and concentrates as well as the grazing received from the plots, so that the full value of 14s. 6d. cannot be attributable to the nitrogen fertiliser. In future it is anticipated that these plots will be sown down to a mixture of Perennial Rye, *Phalaris tuberosa* grasses, with White Dutch and Subterranean clovers, with the view of testing nitrogen fertiliser on the best possible pasture. Plots Nos. 1 and 2 are being prepared for sowing in 1932.

The Waite Research Institute has continued the trials of various grasses in pure species, and in mixtures with clovers, and has also set out, this season, small plots, testing the effect of nitrogen and phosphatic fertilisers on the natural grass, pure Subterranean clover, and a mixture of grasses and clovers sown on virgin land.

Finally, through the grant made to us by the Australian Dairy Council, preparations have been put in hand to commence field trials and seed plots, of the various strains of Perennial Rye and *Phalaris tuberosa* grasses during 1932.

In conclusion, I again wish to record the valuable assistance received from the staff of the Farm throughout the season.

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OUR AGRICULTURAL OUTPUT.

[*Paper read by Mr. F. Coleman (Member of the Advisory Board of Agriculture) at a Meeting of the Saddleworth Branch of the Agricultural Bureau on July* 15*th*.]

The Federal Auditor-General in February last said:—"The only real remedy in improvement in our financial position is to increase the national income," and other financial leaders have repeatedly endorsed this statement.

The national production for 1929-30 was about £650,000,000, in 1930-31 it dropped to £450,000,000. A loss in value of wealth produced of £200,000,000 must be reflected in our financial position. Too often these figures have been overlooked. People have shown more concern about maintaining the high standard of living—a standard built up during boom years with millions of borrowed money too easily obtained and too lavishly spent—rather than concern as to how that, or indeed any living, is to be obtained.

How are we to increase our national income? In this State it can only be done by increasing development of our great natural resources, by increased agricultural output. We have the knowledge, our Agricultural Instructors are doing good work, our people are intelligent; what we need is to apply that knowledge, and to show a will to work along approved lines and the best farming practice.

Is it possible in this district to increase our exportable products? I emphasise "exportable" products, because our market is so limited that we very soon find the product almost unsaleable if confined to ourselves. Vegetables, for instance, have been grown so plentifully around the city that one can purchase almost as much as can be carried away for one shilling. Is there anything in the way of a margin of profit with fresh milk at 4½d. per gallon? But we have a market, low it may be, but still a market for all we can possibly export if of good quality.

Local Organisations.

The Agricultural Settlement Committee, in its report dated November 1st last, recommended the setting up of local organisations to urge the immediate development of better farming methods in each district. It is suggested that precise technical information be prepared by Officers of the Department of Agriculture in collaboration with Officers of the Waite Research Institute, and local committees consisting of bank managers, District Instructors of Agriculture, representatives of the Agricultural Bureau, and the local show society and business men.

Such a local development committee might consider for instance:—

The Wool Industry.—Surely we can keep more and better sheep? Our natural pastures with such excellent grasses as the *Danthonias* are too sparsely covered, top-dressing, and possibly seeding with other grasses and clovers might greatly increase the carrying capacity of these pastures, as has been done at the Waite Institute, with the result that a much greater number of stock can be carried and a heavier clip of wool obtained.

Fat Lambs are coming again to the fore; we need to keep up a more regular supply. The example of some local farmers in introducing new breeds of sheep is all to the good, and deserves every encouragement and support.

Dairying.—This is now regarded as the second greatest industry in the Commonwealth, but is open to much greater development. It has made immense strides in South Australia during the past year or two. We have been exporting butter all through the past year.

The Wheat Industry.—The main industry for the Lower North. Crop competitions have aided this industry, still there is room for reduction in costs of production, and certainly room for increased yields per acre. I want to encourage farmers to keep on growing wheat, for I feel sure it will not fail us, but let us grow the best we possibly can.

The Oat Crop.—Rather a disappointing crop during the past season, but we must find an overseas market. Such a market has been neglected; we ought to be able to grow an oat to market abroad.

Fruit, Wattle Bark, Honey, Poultry, and Eggs are all deserving of greater attention.

Such local organisations as has been suggested would avoid all guesswork, they would work on definite results, dealing with actual facts and figures, and not estimates. What, for example, is the actual cost per lamb delivered at the Abattoirs? What does it cost to produce a bushel of wheat? What money value did the hens return in eggs last season? What are the returns of each cow? The local banker knows the financial standing of each farmer; he knows who is making headway and who is not, and he can probably indicate where savings may be effected. The business man, too, because of his position, can offer sound advice. The Agricultural Instructor and the Bureau members can supply knowledge and experience so dearly bought if the individual has to find it out for himself.

DAIRYING.

I have broadly outlined the work of such local organisations, and now propose to enter a little more into detail. The average butterfat production per cow in South Australia was set down last year at 141lbs. per year. The price at present is low certainly, but it is not likely to go lower. Our butter has been landed recently in London at a time when all the European cows are in the flush of their lactation period, when thousands of tons of Irish or Danish butter have been landed on the London wharves or other ports during May, June, and July. When our peak period of production comes in September, October, and November it will only have the competition of long stored or winter and stable fed cows of Northern Europe, and naturally should command a higher price. There is the possibility that the Ottawa Conference may give some Empire preference, and we may fairly reckon on better prices for export butter between now and Christmas.

The average butterfat production per cow last year was:—Victoria 180lbs., Tasmania 143lbs., South Australia 141lbs., New South Wales 130lbs., Queensland 118lbs., and Western Australia 110lbs. Such figures can be greatly increased. For comparison allow me to give actual figures from my cows. The figures are not so good as they ought to be, and as five out of the 19 cows and heifers just tested failed to pass, the figures can be used for comparison. I include all cows and heifers that have completed their 273 days' test. These averaged 333.61bs. butterfat per cow. I could have taken 10 of these that averaged just over 400lbs. per cow, or seven that average 429lbs. The conclusion is that the State average of 141lbs. of butterfat could be raised at least 50 per cent., or up to 212lbs. per cow, without increasing the feed quantity or adding to the expense or cost in labor. Why aim at only 212lbs. when 312lbs. should be within reach of all?

How are we to improve our returns? In several ways. Clear the paddocks of useless timber, logs, boxthorn, fennell, artichoke, thistles, &c. Do not destroy shelter trees, rather increase them. Subdivide the paddocks, cows like a change of pasture however abundant. Sow grasses suitable to the locality; in this district lucerne, Wimmera rye, and *Phalaris* are as promising as any so far tried. Grow oats on the wheat stubbles for grazing, for hay, or for grain as required. Test the cows, cull out the poorer ones, use the best sires procurable, look after the young stock, and conserve fodder either dry or as silage. Feeding is most important. It has been stated that the weakest point in dairying to-day is feeding rather than breeding.

At present prices of oaten hay, crushed oats, and linseed meal I venture to say any cow can be well fed, apart from grazing, for £8 a year. Allow the cow at least two months after calving before letting her get in calf again, and if you can do it allow her two months or at least six weeks' rest ere she freshens again. A calf once a year is enough.

I believe that prices of butter are likely to rise rather than fall. There may be very little margin if any of profit at present prices. My cows during the past 12 months have returned an average of £12 17s. 4d. per cow—factory return for butterfat—nearly £3 per cow less than 1930-31. Even so I am not prepared to say there is no margin. I think there is a little, and, of course, in the sale of surplus stock there is a considerable return.

There are thousands of acres in the better rainfall areas, as well as the Lower North, that under dairy cattle would produce much more than they do now, and would support a large number of unemployed, who if not directly then indirectly would add to the value of our production and wealth.

MEADOW HAY COMPETITION FOR THE SOUTH AUSTRALIAN ADVISORY DAIRY COUNCIL.

[Judged by R. HILL, Agricultural Instructor.]

Although there were only four entries, the competitors were somewhat scattered, necessitating two days in which to complete the judging.

This was done on April 12th and 13th in dull weather, which probably helped the hay to handle better and be generally more attractive.

Entries were judged on the following scale of points:—

Suitability of plants	25
Curing	25
Stage of cutting	15
Apparent nutritive value	25
Storing	10
	100

Points Allotted.

Competitor.	Position.	Suitability of Plants. 25	Curing. 25	Stage of Cutting. 15	Apparent Nutritive Value. 25	Storing. 10	Total. 100
D. F. Sheppard, Prospect Hill	1	23	23	14	23	10	93
H. A. Woolley, Mt. Barker J.	2	22	22	12	21	8	85
W. T. Vigar, Eden Valley	3	20	21	12	22	7	82
F. Keen, Meadows ..	4	21	20	11	20	9	81

COMMENTS BY THE JUDGE.

1. D. F. SHEPPARD.

Suitability of Plants.—A mixture of subterranean clover (*Trifolium subterraneum*), perennial rye grass (*Lolium perenne*), soft brome grass (*Bromus hordeaceus*), barren brome grass (*Bromus villosus*), and hop clover (*Trifolium procumbens*). Although this was an excellent stack of meadow hay, there was not enough of the grasses present to make an ideal mixture.

Curing.—All plants in this mixture handled well and had a splendid color generally, with the exception of small patches of bleached plants.

Stage of Cutting.—It is generally found that grasses are in a very much more advanced stage of maturity than clovers, but in this case the only objection I could find was that some of the subterranean clover was a little too far advanced.

Apparent Nutritive Value.—Palatability and general appearance were really good, but with too high a percentage of clover. I am of the opinion that the nutritive ratio would be slightly narrow, and hence perhaps cause some waste in feeding.

Storing.—Well stacked on timber in an enclosed shed.

H. A. Woolley.

Suitability of Plants.—Quite a good mixture of subterranean clover (*Trifolium subterraneum*), perennial rye grass (*Lolium perenne*), soft brome grass (*Bromus hordeaceus*), barren brome (*Bromus villosus*), and silver grass (*Festuca Myuros*).

A good mixture of grasses to clover, but the quality of the major portion of grasses is not good. Silver grass in particular does not make a good hay grass at its best.

Curing.—The clover handled well and was in good condition, but the grasses were too dry and fibrous.

Stage of Cutting.—The clover was cut at the correct stage, but the grasses rather late, and to correct this, cutting should have been done a little earlier.

Apparent Nutritive Value.—Rather spoilt by the matured condition of grasses, but the nutritive ratio was quite good.

Storing.—In open stack protected with a bag covering, but a sharper gable would make it more weather-proof.

W. T. Vigar.

Suitability of Plants.—A mixture of subterranean clover (*Trifolium subterraneum*), cluster clover (*Trifolium glomeratum*), soft brome grass (*Bromus hordeaceus*), barren brome grass (*Bromus villosus*), and silver grass (*Festuca Myuros*).

Rather too much of these inferior grasses, and the hay would have been improved with perennial rye grass or Wimmera rye grass in place of some of them.

Curing.—Color very irregular, probably due to lying some time after cutting. The whole mixture handles well, and in patches has a splendid color.

Stage of Cutting.—Grasses too near maturity, but clover good. It would be better to cut earlier, even though the clover be a little on the green side.

Apparent Nutritive Value.—The nutritive ratio appears to be quite good, but palatability has been lessened by fibrous nature of the grasses.

Storing.—In open stack, which is too wide to allow sharp enough gable to make it sufficiently weather-proof. Stack too flat on top.

F. Keen.

Suitability of Plants.—A mixture of subterranean clover (*Trifolium subterraneum*), hop clover (*Trifolium procumbens*), cluster clover (*Trifolium glomeratum*), soft brome grass (*Bromus hordeaceus*), perennial rye grass (*Lolium perenne*), canary grass (*Phalaris minor*), and silver grass (*Festuca Myuros*). Quite a good mixture, but rather too much of the inferior grasses.

Curing.—Very patchy, probably due to being left in the field a considerable time, and handles rather harshly.

Stage of Cutting.—Some of the clover quite good, but as in nearly all other cases, the grasses have been allowed to become too fibrous.

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DECORATION

Apparent Nutritive Value.—Grasses too fibrous and palatability not very good and the nutritive ratio too wide.

Storing.—In shed raised on timber floor, but open to the east.

GENERAL COMMENTS.

An ideal meadow hay from our good rainfall districts should contain approximately half clover and the remainder good, palatable grasses, such as perennial and Wimmera rye grasses, Italian rye grass, or perennial canary grass (*Phalaris tuberosa*).

There are other grasses, of course, but these are the main ones likely to come into prominence in these districts, and it is to be hoped that an effort will be made by landowners to establish some of them to replace the inferior grasses such as soft brome grass, barren brome grass, barley grass, and silver grass.

It might be well to offer a warning to those who have comparatively newly cleared country that it is unwise to attempt establishing perennial grasses other than Yorkshire fog grass (*Holcus lanatus*) on raw soils.

Curing.—There is a general tendency to leave meadow hay too long in the field, causing discoloring and losses in weight, appearance, palatability, and value.

Bad weather conditions very often interfere with the making of first quality hay, but this can be avoided if growers realise that the hay only needs to be in the field for days and not weeks before stacking commences.

Stage of Cutting.—I am inclined to think that farmers are too ready to consider meadow hay as clover hay and lose sight of the fact that the grasses have some value. One repeatedly sees meadow hay spoilt because the clover has been left to a stage which the grower considers is correct for cutting, and by this time the grasses have almost reached maturity. Grasses in this stage are very often left by livestock and wasted. The time of cutting meadow hay should be judged by the grasses and not so much by the clover present.

Apparent Nutritive Value.—Pure subterranean clover hay has a nutritive ratio of about 1 to 4, which makes it rather a wasteful food for general purposes. It is for this reason that grasses should be included in order to widen the ratio, but such grasses must be well cured and not too fibrous. I know that objection is raised by some growers to grasses in hay, but should there be any trouble in getting livestock to eat them the trouble can usually be overcome by chaffing the hay. In fact I am of the opinion that much better results could be obtained from all meadow hay if it were chaffed.

Storing.—In wet districts hay should be under cover, but where this cannot be done a higher gable than generally used would be an advantage in keeping out the rain. To have a gable of reasonable height, it might be necessary to build the stacks not quite so wide.

SIDE-BONE.

Replying to a correspondent who asked, "Can side-bone be cured, and also what is the cause of this trouble?" Mr. R. H. F. Macindoe, B.V.Sc., M.R.C.V.S. (Deputy Chief Inspector of Stock), says side-bone is the hardening of the lateral cartilages of the foot, the cartilage being turned into bone owing to the deposit of bone-making material into it. The actual cause of side-bone is not always clear, but it is an hereditary disease, *i.e.*, can be passed on to the offspring by his or her parents, and also may be caused by concussion. Anything which favors concussion would act as a cause, such as contracted heels and absence of frog pressure.

It is a common disease in heavy horses, but comparatively rare in light horses. Side-bone may also be the result of a blow, a tread, or a weight falling on the region of the cartilage. There is no cure for side-bones, except an operation to remove them, and this is of no benefit except to remove an unsightly enlargement. If there is lameness exhibited, due to inflammation of the cartilage, during the process of ossification, a blister, such as biniodide of mercury 1 part, lard 6 parts, may be applied There are many horses with side-bones which are workably sound all their lives.

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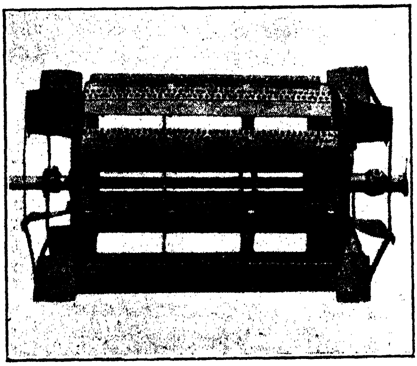

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THE DAIRYING INDUSTRY.

[By H. B. Barlow, Chief Dairy Instructor.]

(Paper read at the Forty-third Congress of the Agricultural Bureau, September, 1932.)

To anyone interested in the Dairying Industry in South Australia, the statistical figures available for the year 1931-32, as compared with similar figures for 1930-31, are very satisfactory from the point of view of production, but although they are not available at present, I am very sorry to have to suggest that the prices realised for the year 1931-32 would not appear quite so favorable.

The figures available are as follows:—

	1930-31. Lbs.	1931-32. Lbs.	Increase. Per cent.
Butter manufactured	12,961,231	17,559,166	+35
Cheese manufactured	3,901,159	5,109,933	+31
Butter exported overseas	2,456,894	7,400,628	+201
Cheese exported overseas	—	894,847	—
Butter sold locally	10,504,337	10,158,538	—3.1
Cheese sold locally or shipped interstate	3,901,159	4,211,086	+7.6
Total number of cows in milk	79,805	90,767	—
Total number of cows dry	20,406	23,171	—
Total cows	100,211	113,938	+13
Total number of springing heifers	9,461	13,818	+46

In considering the reason for the increase in production of both butter and cheese, several factors must be taken into consideration.

1. In a country such as South Australia the prevailing weather conditions are of the utmost importance and to a great extent must be accepted as the controlling factor so far as production is concerned.
2. The number of cows milked also has a direct bearing on results.
3. The management of the cows handled—particularly with reference to feeding—is very important.
4. The productivity of the individual cows handled must be considered.

If we can for a moment forget the price factor the most satisfactory part of our operations is our ability to produce more with approximately the same number of cows and still utilise approximately the same amount of land. From the figures available, I would suggest that we have to a great extent obtained this objective.

From a casual consideration of the climatic conditions last year, one would be inclined to suggest that the season was greatly responsible for our increased output, but if the facts are more carefully analysed, it is apparent that although the season opened up well, it cut out very early in the year, and from October to February the weather was very dry and hot. Notwithstanding the very adverse conditions, our production figures did not fluctuate to anything like the extent expected, and I would suggest that to a very great extent the reason the supply held up was because the cows then in milk were treated more as a serious business proposition and liberally hand-fed during the adverse period.

The latter part of the year—April, May, and June—provided excellent seasonable conditions, and cows which had been held up during the dry period rapidly responded and greatly assisted in our increased production.

Although it will be noted that approximately 13 per cent. more cows were being handled—as dairy cows—than for the previous year, the increase in butter production was approximately 35 per cent., and in cheese approximately 31 per cent., therefore I am optimistic enough to hope that a big proportion of our increased production was due to better management and better producing cows, and I confidently look to the production figures of the next few years to confirm this belief.

The Bull Subsidies.

If, as I hope, a large proportion of our increase in production is due to better cows which have been better handled, I do not think I should omit to mention that in a large part this increase can be expected to have been brought about by our Subsidy Bull Scheme.

In my opinion the Dairy Cattle Improvement Act, which makes subsidising of Dairy Bulls possible in this State, is probably one of the soundest legislative efforts for the improvement in production ever brought forward, and if it had been in operation in one of the larger dairying States the resultant improvement in production would have been noted much sooner.

It is an acknowledged fact that the power to produce milk or butterfat is an hereditary trait and must be bred into the animal, and without question the quickest and best method to obtain a high producing herd is by the utilisation of a good sire.

Not only has our Subsidy Scheme helped dairymen to prove this contention by supplying them with approved sires at approximately half their market value, but it must also act as an incentive to those not in a position to use a Subsidy Bull to obtain the services of the best bull available to them instead of utilising any so-called bull to sire the future members of their herds.

The more I see of breeding operations the more I am convinced that only pure bred, preferably registered sires, bred from high producing cows, should be used.

To make a financial success of dairying, a farmer must—in practically every case—breed his own stock, and a reliable bull is the keystone of success.

Not only has the Subsidy Scheme been a direct benefit by supplying reliable sires, but the information obtained by the State and the individual by the consistent testing of Pure Bred Herds has been of inestimable value.

My personal opinion is that our Pure Bred Testing Scheme in this State has been and is of more value to the Dairying Industry than practically any of our other operations, and the only regret I have is that at the present moment the Dairy Branch has not sufficient staff available to carry out testing operations for the large number of pure-breeders who desire to have their herds tested.

Without a sound nucleus of pure-bred cattle to supply stock for the man on the land we can never hope for very much improvement in our average production, and in my opinion it is almost essential—both for the information of the pure-breeder and the protection of the average dairyman—that all registered females should be officially tested, if at all possible.

It is pleasing to note that the number of springing heifers show an increase of approximately 46 per cent. This is a good sign, and would seem to indicate that farmers are beginning to appreciate the fact the best means of building up a good herd is to breed it themselves.

Notwithstanding the so-called depression, it is satisfactory to note that the local sales of butter are only down about 3 per cent., whereas the local and interstate sales of cheese are 7½ per cent. higher.

The fact that South Australia has definitely commenced to open up an export market for cheese and has sent overseas over ¾ million pounds, is also very satisfactory.

Ensilage.

Whilst discussing the question of production I would like to state that I am becoming more and more impressed with the value of ensilage, either made from cereal crops or grass and clover pastures, as a supplementary food to carry our dairy cattle through the periods when insufficient pasture is available. Not only does ensilage have a marked effect on improving production when being fed, but it appears to keep the cows in better health and thus enable them to more readily respond to good pasture conditions. If fed in conjunction with a phosphate lick it would seem to definitely prevent so-called "Dry Bible," and other indications of mineral deficiency, and it has been suggested, has a tendency to lessen the incidence of Milk Fever, which is much too prevalent in this State.

QUALITY OF DAIRY PRODUCE.

Although we can congratulate ourselves that the quality of our Dairy Produce, particularly butter, has improved during the last few years, nevertheless it must be admitted that we still have a much too small percentage of Choice Quality Butter and too large a percentage of First Grade or what might be termed mediocre Table Butter.

So far as this present year is concerned, the indications are that no imports will be necessary, provided farmers will endeavor to supply good quality cream during the Summer months.

Factories, almost without exception, are better equipped to give efficient service and treatment, but notwithstanding this fact, I trust you will forgive me for reiterating that even the most efficient plant cannot produce good butter from even slightly inferior cream.

The main faults noticeable in cream are staleness and off flavors, generally accentuated by the effect of unclean utensils.

Holding the cream too long on the farm is fatal to good quality, and the failure to wash all utensils, especially separators—whenever used, either morning or evening—is responsible for practically all our inferior cream.

It is not only necessary to produce dairy products, but to obtain satisfactory results the products must be delivered for treatment in a sound condition. The generally accepted idea that any cream is good enough for the butter factory must go by the board.

It is quite late enough for us to accept the fact that the time is long past when the supplier of high quality cream or milk should be compelled by unsound methods of grading at the factory, to carry his careless co-producer, as it were, on his back.

To a certain extent the blending of good and slightly inferior cream together to make a marketable article of mediocre quality has been the accepted policy in South Australia for many years, and the result would seem to be that but a very small percentage of producers are definitely trying to deliver a really high quality product, with the result that only a relatively small proportion of our Dairy Produce, particularly butter, is really of choice quality. It is no good "blinking at facts," and the reports received by highly qualified graders must be accepted.

The technique and manufacture employed by practically all butter manufacturers has greatly improved during the last few years, and this coupled with more efficient plant and machinery has had a marked effect on improving our manufactured article, but if these more efficient methods are to be used to cloak the defects in the cream supplied by a certain percentage of farmers, it is not going to have the ultimate beneficial results which the keenness of the factory employees and the expenditure of the manufacturers deserve.

I am optimistic enough to predict that dairying in South Australia has taken a definite step from being an inconsidered side-line to becoming one of our main primary industries. If this is so it is at once essential that all those interested should do their utmost to endeavor to improve the quality of our dairy products. This object can only be obtained by serious concentration on the part of all interested.

It must be acknowledged as a fact that once we become completely self-supporting for the whole year it becomes increasingly important that we should not only be able to maintain the good quality of our butter sold in the local market, but at the same time ensure that our exportable commodity should be of high quality.

Selling a high grade product on the local market will ensure increased home consumption, and from the producers' point of view, this trade should be fostered as much as possible.

So far as our export trade is concerned, the general average quality is the controlling factor as far as price is concerned.

When South Australia had a comparatively small quota of dairy produce for export the fact that buyers were inclined to only offer 2s. to 4s. lower than the Eastern States were receiving for Choice Quality butter probably did not matter to a great extent, but with, for this coming year at least, a definitely assured large proportion of our output available for export, we, particularly as producers, must do our best to supply a high grade article to the manufacturer in order that the bulk of our exportable surplus might be of sound quality. This is the only way in which we can ever hope to receive the top price for our produce.

To a great extent the fact that our production of butter has increased greatly during the last year has quite altered the position of the supplier of slightly inferior cream, especially throughout the Summer months.

In previous years it has been the practice, during our Summer months, to import higher quality butter from the Eastern States, at a considerable economic loss to South Australia, and blend this good butter with what might be termed our inferior local article and thus utilise a larger quantity of our own product for local consumption than would have otherwise been possible. From the point of view of the producer of a sound article this statement may be a bitter pill to swallow, but it is a fact.

Without any high grade fresh butter to be used for blending purposes, we will have to depend on our own local product, and I sincerely trust that our local producers will, by concerted endeavor, so improve the quality of their raw product during the Summer months that we will be enabled to at least maintain the quality of our locally sold butter to the standard possible during the Winter months.

Admittedly, hot weather has a detrimental effect on cream quality, but it must be a sign of either ignorance or indolence if this fact is not counteracted by more careful handling and more efficient treatment.

The only really justifiable cause for inferior cream is either the effect of pastures (weed flavors, &c.) or the fact that transport facilities are not available to allow of the cream reaching its point of manufacture in a sound condition. There is absolutely no excuse for a large percentage of cream arriving at the factories in an unsound condition due to careless handling (including cleanliness, etc.), and the same statement applies to a large percentage of the stale cream coming forward.

The point I wish to stress is that having gone a long way to developing a sound dairying industry, which from the State's point of view must be a great economic asset, it is essential that we recognise the very often reiterated fact that the quality of our raw product is not all that can be desired, at least in relation to a large percentage of the factory supplies. The improvement of a very large proportion of these inferior supplies is by no means difficult, and does not represent any added expense to the individual, but does necessitate that all cream and milk suppliers, either to butter or cheese factories, do their utmost to supply a sound product. It is not the least amount of good to still think we are in a position to feel insulted when informed by the factory grader that your produce is second-grade, but it must be accepted as a fact that South Australia has for the time being at least joined the ranks of a legitimate dairying State, inasmuch as it represents a large part of our primary production, and therefore we must consider that we have become adolescent and are past the stage when an insult to our personal pride can be assuaged by sending our produce to another factory and have it called Choice.

GRADING.

We must face our responsibility and accept the position that when an efficient factory grader says our cream is inferior it is a fact and must be accepted as such, and the only reasonable method of remedying the trouble is to do our best to correct the trouble, which is in practically every case traceable to some point between the cow and the factory.

Given co-operation on your part, the Department of Agriculture is quite capable and willing to assist you in locating the trouble, and as I see it this is the only way we in South Australia can definitely place ourselves in the dairying arena with credit to ourselves and our State.

For some years I have seen this question of quality becoming more acute, and I think that with a decidedly increased interest in dairying throughout the State, representing as it does much larger financial outlays in farms and factories, the time has come when we must cease to copy the ostrich and bury our heads in the sand, but accept the facts as they are and endeavor to overcome them by concerted action and personal endeavor. Although I have apparently confined my remarks in quality to cream and butter, the position with regard to milk and cheese is practically similar, particularly as far as the producer is concerned.

MILK SUPPLY.

Probably the weakest link in our Dairying Organisation at the present moment is the disorganised state of the Adelaide milk supply. Without going into this matter in detail I would suggest that so far as the producers are concerned the position is very unsatisfactory from the financial aspect and decidedly unsound from the State's point of view.

Much milk is being retailed either by hand or through shops at prices which can be considered less than the cost of production, and it would appear as if, in order to obtain some stability a much better organisation of the distributing method will have to be put into operation.

To a great extent similar conditions have obtained in several of our other capital cities, and the methods adopted to alleviate the trouble should be carefully considered by those interested. On the surface it would appear that some system of control is essential in order to prevent the position becoming chaotic.

In conclusion I would like to make clear a statement recently made by Mr. L. T. Macinnes, Director of Dairying in New South Wales, and published in several of the local papers. The statement was as follows:—

"The official statistical estimates for the total Realisation Values of dairy produce, wool, and wheat, for the year 1931-32 are as follows:—

	Australia. £
Dairy Produce	39,000,000
Wool	29,000,000
Wheat	26,000,000

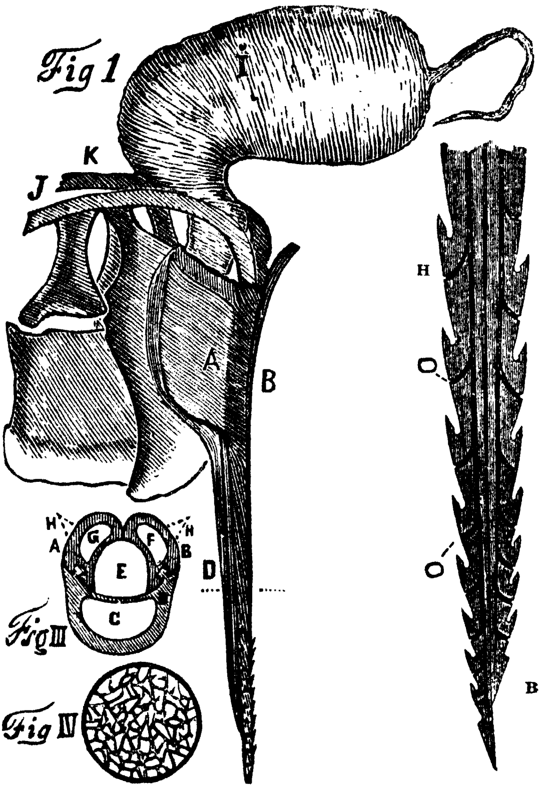
To-day dairying is the premier of all industries (primary and secondary) in Australia in regard to value of total production, numbers of persons engaged or dependent thereon, and capital invested."

In some quarters there would seem to be a misunderstanding with regard to this statement, but it will be noted that it refers to the total realisation value, that is, local sales and export sales, and not only to export sales.

BEES.—LIFE AND CULTURE.

[By R. Nosworthy, Balhannah.]

The bee, as all are aware, is the insect which produces that very nourishing food—honey. In appearance the bee is similar to a blowfly, except that it has a longer body. The male bee (the drone) can easily be mistaken for a blowfly, because its tail is round and not pointed as is the tail of a worker bee. The queen is much longer than the worker, and so can be distinguished from the rest of the swarm, although she is only one among thousands.



The Worker.

Of the bees in a hive, the worker is the most common, as its name implies. As most people know, it has a sting. This is the defence of the worker and is the tail of the bee and not the mouth as is so often erroneously thought. Take a sting and put it under a microscope and the following will be seen:—

In Figure 1, the sting is shown as it leaves the body of the bee. This is black in appearance except *part I.*, which is white. *I.* is a bladder which contains acid or poison which makes the smart that is felt. *Figure* 2 is the point or barbs of the sting, A. and B. being two sets of barbs which move alternately when worked by the muscles J. and K. in Figure 1. The barb A. is forced into the flesh and then barb B., and so on. In *Figure* 3, a cross section of the barbs cut off at D. in Figure 1, is shown

A. and B. show the barbs held in place by C., along which they slide. E., F., G., and H. are hollow tubes, through which the acid is forced at the same time as the muscles J. and K. drive in the barbs. This pumping action of the muscles J. and K. continues after the sting has left the body of the bee. By holding up a sting a drop of acid can be seen accumulating on the tip of the barbs. In taking a sting from the flesh of oneself, it should be brushed off and not pulled out. When it is pulled out, the acid from the bladder is squeezed into the flesh. It is a question of much conjecture as to whether or not a bee dies when it loses its sting. I do not know myself, but I believe that it still goes on working for a short period.

LEGS.

The back legs of a bee are fitted, as it may be said, with baskets in which to gather pollen. The legs have flat sides, over which hairs fold to form the basket. The middle legs are used to carry the pollen from the front legs to the baskets. The front legs are provided with a scraper for taking the pollen off the tongue.

STOMACH.

The bee has two stomachs, one which supplies its own needs and one in which to carry nectar. When gathering nectar from flowers, the bee stores it in its second stomach until it returns to the hive.

The worker bees have various sections of work allotted to them:—(1) Sentinels; (2) nurses; (3) scavengers; (4) retinue; and (5) outside workers.

(1) If one approaches a hive, a few bees will come out to see what is taking place; these are the sentinels. Their task is to watch at the entrance for any intruder that may come along. If a bee from another hive comes to the entrance with the intention of robbing, the sentinel immediately attacks and also warns the rest of the colony. Bees from different hives have different scents, and it is by this means that the sentinels distinguish strangers from brothers.

(2) When the eggs are laid by the queen, the nurses have to feed the resultant larvae when hatched. This work must be done properly because the young bees are the life of the colony. In raising young bees, the nurses have to provide food partly digested for the larvae. They have a special food for the larvae from which the queens are raised.

(3) When the young bees hatch out, they have to clean the cell from which they emerge. Any other refuse which may be found in the hive is also taken out by these scavengers. In addition to this, they manage the storing away of the honey and pollen as the outside workers bring it in.

(4) Wherever the queen may go, a retinue of six or seven bees will nearly always be found following. When she is laying, two examine each cell as the eggs are being deposited to see that not more than one egg is left to a cell. If two are deposited, one will be removed to another cell. It is also part of their work to feed the queen.

(5) The gathering of honey and pollen is done by the outside workers. When gathering honey, the bee travels from bloom to bloom until it can carry no more. The collection of pollen is a very interesting part of the work. The bee picks up the pollen on its tongue, at the same time making it moist. It wipes its tongue on the scrapers on the front legs, and from there the middle pair of legs take and pack it into the baskets on the back legs. Being moistened on the tongue with a little honey, it has the appearance of a tiny wad. This readily sticks in the baskets. The process is gone through so quickly that it is very hard to follow unless watched closely.

THE QUEEN.

The most important bee of a colony is the queen, there being only one queen to a hive. Hers is the herculean task of laying enough eggs to keep the colony thriving. As there are approximately 60,000 bees to a good swarm, and the average life of a —during the working period of honey collecting—is from three to six weeks, she has to lay about 3,000 eggs daily. She has to perform this task right throughout the honey season. During the winter she has a rest because the bees, not working, live for several months. She may live for about six years, but in the last season or so will not be very productive. Her life's work commences when she is from eight to 10 days old, but much depends upon her being fertilised by the drone. In mating with the drone she is fertilised for life by absorbing into her body the organs of the drone, which dies immediately on mating with the queen.

A most remarkable feature of the raising of the eggs and larvae is that the queen lays the eggs and the bees themselves do the rest. For instance, from given eggs they will raise either queens, workers, or drones. This is done by supplying various foods to the larvae as soon as hatched. In raising a queen, a special cell is constructed and a food (royal jelly) is given to the larvae in that cell. These cells are isolated and are much larger than any other in the hive. A queen takes about 16 days to hatch, the worker 20 or 21 days, and the drone 24 or 25 days.

THE DRONE.

The drone is the male bee and his only job in life is to fertilise the queen. Very often the drones are killed off by the workers as being useless.

SWARMING.

In spring, when the bees swarm, queens are raised in numbers. As many as 17 queen cells have been taken from a hive in one day to prevent it from excessive swarming, thus weakening the colony. When a young queen is hatched, the old queen takes a large number of bees to look for a new home, leaving the young one in the old hive.

Swarming bees, previous to leaving the hive, gorge themselves with honey in order to have enough food for two or three days. It is very seldom that they sting when they have only just come out of the hive.

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(WALLAROO-MOUNT LYELL)

IF YOU HAVE NOT USED IT—GIVE IT A TRIAL.
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HONEY.

The nectar that the bees collect is not fit for use as honey until it has been treated. The bees add a little of the acid from their stings. This is a preservative similar to salicylic acid. After being kept in the cells for three or four days the bees cap or cover it with a thin coating of wax. This is fit for use as honey.

WAX.

Wax is a material made by the bees. It is secreted from the joints of their bodies. Used in making the honeycomb, wax is one of the most essential things in a hive. The sense of location of the bee is wonderful. Although there may be as many as 100 colonies all in one place and every one exactly alike, a bee will come home from the fields and go to its correct hive. Shift a hive, say, 3ft., and you will see the bees hovering around where the entrance was, and they will take a long time before finding the hive.

GENERAL MANAGEMENT.

When keeping bees, the first thing to do is to give them a good home; a box that will keep out all wet, draughts, and enemies. Spiders and ants are the two worst enemies. Again, give the bees good frames in which to build up comb, because it is by these frames that the taking of the honey is simplified. It is also advisable to provide foundation comb with the frames and thus save the bees a good deal of work. Bees eat approximately 21lbs. of honey to produce 1lb. of wax. Therefore it pays the apiarist to provide wax in the form of foundation.

For purposes of taking honey the bees should be placed as near the flowers from which they gather the honey as possible, thus saving travelling and time going to and from the hive. Also place the hives as near to a supply of fresh water as may be convenient. The bee uses an unusual amount of water. The entrances should be facing the east in order to obtain the morning sun and also away from the weather.

In extracting honey, the combs are taken from the hive, the bees shaken and brushed off, and taken into a small enclosure nearby. If the honey is capped over, a knife heated in boiling water is used to remove the caps. The frames are then placed in an extractor containing revolving cages. Being turned at a fair speed the honey comes out at a tangent, leaving the combs, which are returned to the hive, empty. Care should be taken to see that no larvae are in these frames. It is quite safe to extract the honey from combs that have either eggs or capped brood.

The cappings which are cut off the combs are melted down and cleaned to obtain the wax of which they consist. It is these cappings which provide the wax for the bee-keeper to make foundation comb to put into the frames for the bees to make the comb proper. Extracting when the bees are gathering plenty of honey may be carried on every four or five days; much depends, however, on the strength of the colony.

When honey becomes scarce, it is not profitable to rob the hives, because the bees will be so weakened that they will die out. Honey is their winter supplies, and must last until next spring. By taking it when scarce they are starved.

If a large number of colonies is kept it pays to move them periodically. Also, moving them from place to place provides fresh blooms for them to collect honey and pollen. At every move fresh water should be handy. The frames should be fixed firmly to prevent rocking and killing the bees.

At times when honey is short, strong colonies will attack weaker ones and rob their honey. To guard against this, the entrances of all hives should be closed down by placing a stick across, to allow only three or four bees to come out at once. By doing this the robbers are confined to a small space by which to enter.

Always be careful to see that the swarms are free from disease. The worst of all is ''foul brood,'' and is very contagious. This disease is not of the bees themselves, but of the brood about to be hatched. The brood which is capped does not hatch out, and when the bees clean the cells, the stench is so bad that they leave it. It is first noticed by a swarm weakening very rapidly on account of no young bees. Everything in the hive carries the germs of the disease, so that the only safe and sure way of eradicating it is by smothering the bees and then burning everything that has been infected.

SOLUBLE SALTS IN NON-IRRIGATED VINEYARDS.

[By A. R. Hickinbotham, B.Sc. (Chemist), and J. L. Williams, R.D.A. (Lecturer in Viticulture), Agricultural College, Roseworthy.]

Introduction.

During the last few seasons numerous reports have been received of partial or complete failure of vines in portions of vineyards in certain non-irrigated areas. In some cases damage was confined to partial defoliation, in others fruit was unsaleable, and in bad cases the vines got worse each season and finally died.

The first indications of the trouble were scorching of the tip and edges of the lower leaves, which slowly worked inwards until only the main ribs remained green; later nearly all the leaves were sometimes affected. New growth became weak and spindly, the margins of the leaves turning brown before they were fully formed, and in many cases the berries failed to ripen. The same vines were generally more seriously affected in succeeding seasons.

Samples were obtained from affected vines and soils of parts of the College vineyards and certain vineyards near Lyndoch, and an examination of these showed the cause to be soluble salts.

The Salt Content of Lyndoch Waters.

The affected area at Lyndoch consists of flat land along both sides of a creek. Underground water stands at a depth of about 9-10ft. Analyses of water taken from the creek above and below the area, at points about two miles apart, and from a well near the upper end of the area (depth to water 9ft.), are given in the following table.

Table I.—*Lyndoch Creek and Well Waters (Parts per 100,000).*

Sample.	Total Salts.	Cl.	CO_3.	HCO_3.	SO_4.	Ca.	Mg.	Sodium Chloride	pH
Creek above..	157	45	2	51	9	8	9	74	8·24
Creek below .	344	122	3	54	26	14	20	201	8·05
Well water ..	180	56	2	38	13	9	8	92	8·12

Note.—Sodium chloride (common salt) = chloride x 1.65.

From the table it will be seen that the water of the stream has accumulated salts in passing through the area, and this accumulation must consist of the salts in the drainage waters of the adjacent flats. Further, the average concentration of salts in the drainage waters received by the stream must be greater than that of the stream. Sodium Chloride is the most important of the salts present, and the percentage of this increases from 46.6 per cent. to 58.4 per cent. in passing through the flats. It is interesting that sodium chloride does not appear to the same extent in the salts occurring in the top 3ft. of the soil (Table II.), but that the increase in chlorine content of the canes of affected vines is most marked (Table IV.).

The importance of this salt content may be judged by comparison with irrigation water. With the latter, damage to the soil and the crop may result from water containing less than 70 parts per 100,000 of the ordinary soluble salts (1), but the kind of salts, and the nature of the soil will considerably modify any standard set. Californian results indicate that, where the salts are manly chloride and bicarbonate of sodium (as in this case), water containing more than 60 or 70 parts should not be applied in most cases (2). From a general survey of irrigation waters, Harris and Butt concluded that, under average conditions, more than 100 parts of sodium chloride, or 400 parts of mixed salts, are dangerous (3). The limit generally accepted in South Australia is 100 grains of total salts per gallon, which is equal to 143 parts per 100,000, the principal salt in our waters being, usually, sodium chloride.

A comparison of the results of analyses given in Table I., and the conclusions drawn from them, with the figures just quoted, indicate that the water of the Lyndoch area has a dangerously high concentration of salts, so that any rise of this water in the soil may be expected to lead to serious salt trouble. Therefore, surface evaporation must be reduced to an absolute minimum by maintaining a surface mulch, and by keeping down weeds during spring and early summer at least.

SOLUBLE SALTS AND pH OF AFFECTED SOILS.

The concentration of salts in the soil of affected patches, and their pH values, are also high, as shown in Table II.

The edge of an Affected Patch.

The pH of a soil is a measure of its acidity or alkalinity. Until recently it was considered sufficient to know that a soil was acid, or that it was not acid, but actually it is often found desirable to know just *how* acid it is. A few years ago no satisfactory method of measuring this was known, but it is done now by means of the pH scale, the symbol "pH" standing for acidity measurement just as the symbol "%" stands for per hundred measurement. That is, the pH scale measures the degree of acidity or alkalinity of soils or other substances. It has been found that excessive alkalinity is as bad as excessive acidity.

Acidity and alkalinity are opposed properties, and by mixing acid and alkali (say spirits of salt and caustic soda) in proper proportions, the characteristic properties of each are destroyed and the mixture is then neutral. Soils range on the pH scale between about 4 and 9.5; those of pH 7 are neutral, those below 7 are acid, while those above 7 are alkaline. Most crops do best with the soil nearly neutral. Very acid soils of pH about 4 or 5 give poor results until their pH is raised near to 7 by liming (lime being alkaline destroys some of the acidity). Gypsum will not correct acidity, because it is a neutral compound of lime and sulphuric acid, formed by the blending of these substances in the proper proportions.

At a pH above about 9 the soil is at the other extreme to acidity, being then too alkaline, and crops again do badly or are killed; some means of lowering the pH of the soil must then be devised. The application of acids, and of sulphur (which is converted to sulphuric acid by bacteria), have been used successfully, but are expensive. Gypsum, which acts in this case by reaction with the soda compounds causing the alkalinity, forming less alkaline or sometimes beneficial substances, is also effective, but large dressings may be necessary. These methods take perhaps two to three years or more to give their full effect.

Table II.—*Content of Soluble Salts (Parts per 100,000), and pH Values, of Some Affected Soils.*

Soil.	Depth of Sample.	Total soluble Salts.	Cl as Sodium Chloride	pH.	Remark.
A	0–8ins.	146	18	9·03	Variety Shiraz, affected for several years.
	8–20ins.	180	21	8·82	
	20–36ins.	288	45	9·06	
B	0–1ft.	98	13	8·90	Variety Mataro, affected for several years.
	1–3ft.	200	48	9·14	
C	0–1ft.	74	13	8·90	Shiraz and Doradillo affected, Grenache comparatively unaffected. First noticed last season.
	1–3ft.	102	10	8·93	
D	0–1ft.	80	13	8·48	Grenache vines over 45 years old, reported not affected.
	1–3ft.	142	28	8·07	
E	0–1ft.	76	20	7·95	Land never under vines, sample taken 35yds. from D.
	1–3ft.	70	10	7·99	

Note.—The reading obtained for the pH value is somewhat low when soluble salts are present.

Tolerance of the Vine for Salts.

A very extensive study of salt troubles has been made in California, and observations made there indicate that grapes are one of the most resistant fruit crops to soluble salts. They were found to grow well in soil containing 77 parts of sodium chloride, or 286 parts of total salts per 100,000 (4). In Morocco, which has a climate very similar to ours, grapes have been found to be unaffected by 60 parts of total salts in the surface soil, but the vines languished and became unprofitable with 80 parts in the surface soil and 270 in the subsoil, while vines were dead with 170 parts in the surface and 370 in the subsoil (5).

Salt Content of Affected Local Soils.

The soil samples from affected patches (Table II.) were taken in April and May, and it is possible that the concentration of salts in the surface 3ft. has been reduced since mid-summer when the vines were affected. Sodium chloride, in particular, moves readily with water in the soil. But, if the concentration shown is the maximum reached during the year, it is still excessive in comparison with the limits just quoted.

Local observations suggest that different varieties of the vine vary in susceptibility. Doradillo appears to be particularly susceptible, while Grenache is possibly the most resistant variety grown locally. The response to conditions by varieties mentioned in Table II. is in agreement with this.

The Importance of Lime.

The percentage of lime in the soils of affected patches, and especially that occurring as carbonate, is low, as shown in Table III.

TABLE III.—*Lime and Magnesia in Affected Surface Soils (Hydrochloric Acid Extract).*

Soil.	CaO. Lime.	MgO Magnesia.	Carbonate.	Remark.
A, 0–8in. ...	·31	·23	trace	Badly affected for some years.
B, 0–1ft. ...	·23	·38	trace	Badly affected for some years.
C, 0–1ft.....	·65	·56	low	Recently and less seriously affected.

A soil has a much better chance of resisting salt damage if it is well supplied with lime, particularly when it contains some carbonate which acts as a lime reserve. These soils are not well supplied. It will be noticed, too, that the effect of the salts is in proportion to the deficiency of lime.

It is difficult to state a figure which would satisfactorily represent a sufficiency of lime—probably near .5 per cent for these soils would be a minimum—but so much depends on conditions and the form in which it exists in the soil. Sufficiency should be measured by the proportion of clay combined with lime rather than by the total amount of lime present.

Showing effect on Vines in comparison with Healthy Vines.

Briefly stated the fine particles of clay can combine with lime, soda, magnesia, and other metals to form a lime-clay, a soda-clay, and so on. In a good soil the great proportion of the clay occurs as a lime-clay. When soda salts occur in the soil, the lime-clay, by a chemical reaction, exchanges its lime for soda, and the bulk of the clay may then occur as a soda-clay. If the original soil was was well supplied with lime, this must happen more slowly.

Lime-clay is loose and friable and easy to work, is nearly neutral, easily penetrated by water, not sticky when wet, and naturally maintains favorable conditions for plants. A soda-clay is very much the opposite, being dense and heavy, setting like a brick, very hard to break up when dry, sticky or even pasty when wet, and is penetrated by water very slowly; when wet it is definitely alkaline (pH about 9 or higher) and it forms a most unfavorable medium for plants. In the salt affected parts of this area, and to a lesser extent over most of the area, the clay, by reaction with the soda salts, has become largely a soda-clay, and the soil has these undesirable characteristics.

How Soils May be Improved.

The free soda salts can be removed from the soil by washing them out—rain passing down through the soil will do this—but the soda-clay can only be changed to a lime-clay by offering the clay particles an excess of lime with which they can combine to replace the soda. Further, this change can only occur readily with lime in soluble forms so that it can travel in the soil moisture to all the particles.

Improvement in these salt patches, therefore, can only be effected by adding lime, either in an already soluble form, or in a form in which it can become soluble by natural reactions occurring in soils. Under the best conditions replacement of soda will be slow—a matter of years for the full effect to develop. Gypsum meets requirements well; next best is quick or slaked lime, then very finely ground limestone. Excepting gypsum, the other forms of lime soon become carbonate after application, and are then insoluble until further reaction with more carbon dioxide occurs, when soluble bicarbonate of lime forms. The necessary carbon dioxide is formed from decaying vegetable matter, so that these forms of lime require the soil to be well stocked with humus. This can only be assured by using stable manure or green manuring. It is possible for lime already in the soil to be relatively ineffective, because sufficient carbon dioxide cannot be produced; in such a case green manuring may be all that is necessary.

In some cases it is perhaps improbable that correction can be brought about economically, but in many cases small dressings of 1-2 tons of gypsum per acre have a really wonderful effect on the character of similar soils. Reclamation of these patches should be approached on an experimental basis by applying gypsum (or lime) at the rate of 1-2 tons per acre, and/or green maure, to a small area and noting the amount of improvement. The dressing should be applied to the cultivated soil and harrowed in; it will penetrate down by the action of rain. If ploughed in it will not be well distributed, and does not affect the surface soil which is most important. Once the surface is in good trim, the soda-clay in the subsoil is little disadvantage (6) except that it stops some water from soaking down. This improves as the lime works down (7).

Risk of Extension of Salt Damage.

The problem presented by the salts of this area may be summed up as follows:—
So long as salt is allowed to rise in the soil, the soda-clay will increase, and less and less rain water will pass through the soil to wash the salt back again; the soil will get progressively worse.

With lime and organic matter added the rain will pass down more easily, taking the salts with it, and further improving the penetrability of the soil each winter, so that more and more rain can pass through; the amount of salt reaching the surface will get less each summer, and the soil will steadily improve.

Drainage.

The problem is, of course, identical in most respects with that encountered under irrigation, where drainage is the first recommendation. In this case drainage does not appear an economic solution at the present time, though possibly it is the only really effective one. To get full effect from drainage, however, water for flooding must be available. Again, the area was cropped for a long time before trouble showed up; this encourages the belief that if controllable conditions are swung a little more in the right direction the rise of salts can be satisfactorily checked.

Effect on Composition of the Vine.

The main effect of the soluble salts (chiefly sodium chloride) on the composition of the vine is in the amount of chlorine (and possibly sodium) in the canes. The quantities of starch, sugar, and nutrients were found to be almost identical in affected and normal canes, but the amount of chlorine in affected canes was several times that in normal ones, as shown in Table IV.

TABLE IV.—*Ash and Chlorine in Vine Canes (Per cent. of Air-dry Cane).*

Sample.	Condition.	Ash.	Chlorine	Remark.
College Shiraz, 1931.	Affected.	3·71	·36	Practically bare in December.
“ “ “ (check)	Normal.	2·97	·06	Average yield.
College Shiraz, 1932......	Affected.	3·39	·35	Practically bare in December.
“ “ “ (check)	Normal.	2·97	·095	Average.
Lyndoch Shiraz	Affected.	3·10	·325	Not picked, defoliated, (soil C).
“ “ (check) ..	Less affected	3·13	·22	Fruit picked, leaves scorched.
College Shiraz	Normal.	2·68	·06	Very good block.
College Shiraz	Normal.	3·10	·085	Poor vines.
Lyndoch Mataro	Affected.	3·45	·36	Not picked, defoliated, (soil B).
“ “ (check) ..	Normal.	2·52	·06	Yielded well.
College Mataro	Normal.	2·40	·055	Fair old vines.
College Mataro	Normal.	2·60	·06	Good young vines.
College Grenache.........	Normal.	3·06	·08	
College Car. Sauvignon ..	Normal.	2·39	·04	

The table shows that all seriously affected vines contained more than .3 per cent. of chlorine in the canes, while all normal vines contained less than .1 per cent. A partly affected sample contained .2 per cent.

Young Canes and Bunches from Affected and Normal Vines.

CANE ANALYSIS A TEST OF SALT RISK.

From these figures it would seem probable that the vine itself is a much more reliable indicator of the approach of salt trouble than the soil. It is much simpler to take cuttings from a dozen vines than to take even one soil sample. The cuttings represent the actual effects of the soil constituents on the vines over the area sampled, and to whatever depth the roots penetrate. Therefore, examination of the canes would appear to be a more reliable guide to conditions.

The variation in chlorine content of the canes appears from these analyses to be much more pronounced and clearly defined than the variation of salts in the soil. Further, the content of salts in the soil varies, sometimes rather rapidly, so that soil samples need to be taken at the right time. On the other hand, cuttings can be taken at any time up to pruning.

It is suggested that an examination of canes for their chlorine content, applying the limits indicated above, might prove a useful guide to salt distribution, and could be used as a simple, regular check on doubtful areas, as well as a guide to the benefit (if any) obtained by efforts at correction. In these analyses chlorine in canes was determined by the A.O.A.C. method (8); the content in the ash was unreliable.

SALT RISK AND CULTURAL METHODS.

The rise of salt that has often occurred when land was placed under irrigation and planted to vines and orchards has been generally ascribed entirely to the irrigation. From this investigation there appears to be some evidence that the cultural methods associated with these crops may be the cause of some part of the trouble.

CONCLUSIONS.

1. Drainage, which is the most reliable method of correcting these conditions, is costly and not an economic solution here at the present time.

2. It is unlikely that any treatment will recover the worst patches, and these might most profitably be given over to alkali resistant crops.

Those generally recommended are lucerne (when once started), berseem, barley and rye, millets and sorghums, rape, beet and mangolds, oats and sweet clover (*Melilotus alba*). Forage and cultivated crops only are advisable.

3. Every effort should be made to reduce surface evaporation, with a consequent rise of salt, by maintaining a surface mulch at all times when evaporation can take place, and by keeping weeds, &c., down.

4. Stable manure where possible, and green manure, are advisable to open the soil and improve its texture. This will permit rain to wash the rising salts down beyond root reach, and will make cultivation easier.

Decomposition of this organic matter will provide carbon dioxide to aid in removing soda as bicarbonate, and it will help to distribute all lime available.

Organic matter is of comparatively less value when lime is deficient.

Melilotus alba is salt resistant, a legume, and its roots penetrate deeply and decay quickly, opening the subsoil. It has been widely used overseas for this purpose, but in our conditions King Island Melilot would probably give better results.

5. As much rain water as possible must be made to penetrate down through the soil to carry salt down. This can be effected by breaking up the soil before the winter rains, by organic manures, and by gypsum or lime.

6. Dressings of gypsum or lime should be tried experimentally. These will, at least, make cultivation easier and permit the breaking up of the soil before winter. It is possible that such dressings will correct most of the trouble within a few years.

7. After dressings, cultivation must be shallow to avoid bringing up unchanged soda-clay to the surface.

REFERENCES.

(1 and 2) Harris, "Soil Alkali," p. 229.
(3) Ibid., p. 237.
(4) Ibid., p. 220.
(5) Warrington, "Physical Properties of Soil," p. 220.
(6) Sir E. J. Russell, "Soil Conditions and Plant Growth," VI., p. 304.
(7) Greene, "Journal of Agricultural Science," XVIII., p. 531.
(8) "Methods of Analysis of the A.O.A.C., II., p. 43.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

Section 1—White Leghorns.

Competitors.	Address.	Score to Month ending October 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals.
Austwick, S.	West Marden	(1) 115	(2) 128	(3) 96	339
Barker, C. R.	Edwardstown	(4) 69	(5) 101	(6) *	170
Bolland, H.	Knoxville	(7) *	(8) 115	(9) 80	195
Butson, A.	Clarence Park	(10) 117	(11) 83	(12) 122	322
Carmichael, A. B.	Woodville West	(13) 93	(14) *	(15) *	93
Carroll & Leedham	Forest Gardens	(16) 63	(17) 110	(18) 114	287
Carter, W. A.	Glandore	(19) 98	(20) 120	(21) 78	296
Cleland, W. L.	Beaumont	(22) 97	(23) 107	(24) †	204
Cooke, B.	Kanmantoo	(25) 62	(26) 103	(27) 145	310
Cooper, Syd.	Edwardstown	(28) 102	(29) 84	(30) 92	278
Crawford, L. H.	Grange	(31) 135	(32) 62	(33) 99	296
Crittenden, R. C.	Kilkenny North	(34) 112	(35) 145	(36) 145	402
Dawes, A. G.	Glenunga Gardens	(37) 142	(38) 101	(39) 122	365
Dawes, A. G.	Glenunga Gardens	(40) 86	(41) ‡	(42) ‡	86
Dawes, A. G.	Glenunga Gardens	(43) 139	(44) 98	(45) *	237
Dawes, A. G.	Glenunga Gardens	(46) 124	(47) 106	(48) 93	323
Dawes, A. G.	Glenunga Gardens	(49) 78	(50) 94	(51) 128	300
Dawes, A. G.	Glenunga Gardens	(52) 89	(53) 157	(54) 99	345
Dawes, A. G.	Glenunga Gardens	(55) 119	(56) 99	(57) 113	331
Duhring, T.	Mallala	(58) 22	(59) 96	(60) 112	300
Easther, Colin J.	Black Forest	(61) 127	(62) 95	(63) 136	358
Edgcumbe, J. L.	Plenty, Victoria	(64) 129	(65) 131	(66) *	260
Fidge, H.	Clarence Park	(67) 75	(68) 116	(69) *	191
Fox, Russell H.	Edwardstown	(70) 76	(71) 58	(72) 126	260
Gilbert, L. H.	Glanville Blocks	(73) 63	(74) *	(75) 105	168
Goldsmith, Keith	Kensington	(76) 130	(77) *	(78) *	130
Gore, A. G.	Summertown	(79) 142	(80) *	(81) 120	262
Gurr, A. & H.	Scott's Creek	(82) 74	(83) 131	(84) *	205
Hefford, H. H.	Murray Bridge	(85) *	(86) *	(87) 106	106
Hefford, H. H.	Murray Bridge	(88) 130	(89) 93	(90) *	223
Hillyer, Jas.	Kilkenny	(91) 104	(92) 127	(93) 127	358
Hodgson, W. H. A.	Salisbury	(94) 72	(95) 69	(96) 77	218
Lamerton, E. A.	Edwardstown	(97) 97	(98) 93	(99) *	190
Lindquist, E. F.	Semaphore Park	(100) *	(101) 128	(102) 137	265
Lindsay, Mrs. P. G.	Croydon	(103) 78	(104) 80	(105) ‡	158
Morris, H.	Seaton Park	(106) 106	(107) ‡	(108) 77	183
McPherson, K. R.	Blackwood	(109) ‡	(110) ‡	(111) 42	42
Nicholls, H. R.	Eden Hills	(112) *	(113) *	(114) ‡	—
Oliver, J. H.	Goodwood Park	(115) 96	(116) *	(117) *	96
Radbone, T. B.	Colonel Light Gdns.	(118) 95	(119) 94	(120) 113	302
Rassmussen, H. A.	Ethelton	(121) 116	(122) 84	(123) *	200
Woodbury Poultry Farm	Crafers	(124) *	(125) 41	(126) 100	141
Woodbury Poultry Farm	Crafers	(127) 104	(128) 127	(129) 127	358
Rowe, Bruce	Two Wells	(130) 135	(131) *	(132) 108	243

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitors.	Address.	Score to Month ending October 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 75	(134) ‡	(135) 128	203
Slape, W. C.	Magill	(136) 141	(137) 85	(138) 134	360
Thomas & Elson	Hawthorn	(139) 110	(140) 90	(141) 99	299
Thomas & Elson	Hawthorn	(142) 114	(143) 118	(144) 128	360
Vowels, C. C.	Westbourne Park	(145) 112	(146) 123	(147) *	235
Welford, F. F.	Colonel Light Gdns.	(148) 65	(149) 86	(150) 109	260
Urlwin, A. P.	Balaklava	(151) 87	(152) 101	(153) 97	285
Wiese, W.	Cabra	(154) †	(155) 74	(156) *	74
Wiese, W.	Cabra	(157) *	(158) *	(159) *	—
Williams, F. J.	Millswood Estate	(160) *	(161) 102	(162) *	102
Williams, W. R.	Frewville	(163) 100	(164) 123	(165) †	223
Williams, W. R.	Frewville	(166) 144	(167) 73	(168) 117	334
Woodley, W.	Tailem Bend	(169) 90	(170) 102	(171) 102	294
Connor, D. C.	Gawler	(172) ‡	(173) 121	(174) 115	236
Tolhurst, A. E.	Torrens Park	(175) 79	(176) *	(177) 104	183
Gurr, A. & H.	Scott's Creek	(202) *	(203) *	(204) 121	121
Totals		4,998	4,574	4,393	13,965

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

Competitors.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Gameau, V. F.	Woodville	(178) 64	(179) 92	(180) 82	238
Totals		64	92	82	238

Anconas.

Competitors.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Williams, W. R.	Frewville	(181) 70	(182) 72	(183) *	142
Totals		70	72	*	142

SECTION 3—BLACK ORPINGTONS.

Competitors.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Richardson, N. F.	Woodville	(184) 89	(185) 147	(186) 134	370
Cook, Arthur	Colonel Light Gdns.	(187) 137	(188) *	(189) ‡	137
Cooke, B.	Kanmantoo	(190) *	(191) *	(192) 104	104
Crago, Jack	Prospect	(193) 88	(194) 81	(195) ‡	169
Crawford, L. H.	Grange	(196) 135	(197) 93	(198) 87	315
Dowling, J. H.	Glossop	(199) *	(200) *	(201) *	—
Hudson, F. J.	Prospect	(205) 148	(206) 109	(207) *	257
Mills, H. J.	Edwardstown	(208) 92	(209) 127	(210) 157	376
Mills, H. J.	Edwardstown	(211) 81	(212) 167	(213) *	248
Rawe, J.	Seaton Park	(214) 147	(215) *	(216) *	147
Schubert, B. O.	Tanunda	(217) 59	(218) *	(219) 79	138
Frisby Smith, G.	Fulham	(220) 87	(221) 110	(222) 139	336
Twartz, H. L.	Gawler	(223) 132	(224) 112	(225) 129	373
Williams, W. R.	Frewville	(226) 144	(227) ‡	(228) 70	214
Williams, W. R.	Frewville	(229) 95	(230) 134	(231) *	229
Woodley, W.	Tailem Bend	(232) *	(233) 146	(234) 150	296
Totals		1,434	1,226	1,049	3,709

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Competitors.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Fidge, H.	Clarence Park	(235) 112	(236) 93	(237) 76	281
Gameau, V. F.	Woodville	(238) 140	(239) 86	(240) ‡	226
Williams, W. R.	Frewville	(241) 121	(242) 80	(243) 106	307
Totals		373	259	182	814

* Denotes disqualified under Rule 13. ‡ Denotes did not lay during July. † Dead.

STATE OF SOUTH AUSTRALIA.

USE OF POWER ON FARMS AND STATIONS.

MACHINERY, TRACTORS, ENGINES, ETC., AND HORSES.

Item.	1927.	1928.	1929.	1930.	1931.
Value of Machinery.					
Agricultural	£6,493,663	£6,703,873	£6,702,605	£6,312,840	£6,078,045
Orchards, vineyards, &c.	490,281	493,787	490,271	475,914	476,322
Dairying	208,984	202,587	190,451	184,860	193,504
Pastoral	576,425	584,854	555,508	494,548	464,755
Total	£7,769,353	£7,985,101	£7,938,835	£7,468,162	£7,212,626
Tractors.					
Number	2,503	2,979	3,730	3,991	3,992
Horsepower total	60,253	74,783	92,240	99,656	99,862
Horsepower average	24·07	25·10	24·73	24·97	25·02
Engines (Portable and Other).					
Number	12,951	13,265	13,922	13,992	14,306
Horsepower total	69,842	70,677	75,058	75,146	75,772
Horsepower average	5·39	5·33	5·39	5·37	5·30
Horses.					
Under 1 year	7,617	5,954	4,634	4,383	7,899
1 year and over	216,410	199,911	184,420	179,146	177,323
Total	224,027	205,865	189,054	183,529	185,222
Kinds of Machinery.					
Ploughs	—	—	28,702	29,704	30,181
Cultivators	—	—	19,413	19,276	19,482
Harrows (leaves)	Not collected prior to 1929		99,910	100,070	102,391
Seed drills and combines			18,333	18,528	18,775
Binders			10,850	11,018	11,029
Strippers			8,151	8,557	8,602
Harvesters			7,642	7,573	7,594
Reaper thresher			5,026	5,118	5,222
Winnowers			—	5,050	5,722
Separators	18,918	18,505	18,458	18,616	19,285
Milking machines—					
Unit size—					
2	124	115	116	113	119
3	160	156	147	158	155
4	83	86	76	77	90
5	7	4	9	8	7
6	13	9	8	11	9
Total	387	370	356	367	380

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR NOVEMBER.

[By CHAS H. BEAUMONT, District Horticultural Instructor.]

Control of pests will be the main work of the month in the orchard and vineyard. Neglect of precautions may mean the loss of the crop and perhaps of the tree or vine.

For oidium, dust the vines with sulphur; a little lime is an advantage in the spreading. If downy mildew is noticed bordeaux must be used at once. Young vines may need protection from cut worms, which work at night; dust or spray with arsenate of lead.

In the orchard, codlin moth will need most attention, and we rely mainly on arsenate of lead to check this pest, and the fruit must be kept covered during the growing period. Bandages are a considerable help, and the new type chemical bandages do not require to be examined very often, but ordinary bandages of bagging must be cleaned up fortnightly at least. Arsenate of lead will stop cherry slug or pear slug; this pest attacks other trees so that all must be treated.

Aphis has been troublesome again and may still need to be sprayed with black leaf 40, or dusted with nicodust. This will also check thrips. Lime sulphur will be used on apples and pears to control scab or black spot and a cool day should be chosen for the work. Pure water is necessary for diluting lime sulphur solutions.

It is good practice to thin out clusters of apricots and peaches, if we want fruit of quality and appearance.

Cultivation of the soil is most important; the soil should be worked down to fine tilth, and no weeds allowed; this applies especially close to the trees. Strawberry beds should be free from weeds and will be helped materially by a covering of mulch. Punnets should be filled equally with berries of one size and quality.

See that young trees and vines do not suffer for want of water, and if the big trees need water, see that they get it in good time, and loosen the soil as soon as possible afterwards.

Boxes and picking equipment should be clean and ready for use.

Dehydrators, trays, and racks should be got ready at first opportunity.

TRUSTEESHIP WITH SECURITY

RAPIDLY INCREASING NUMBERS OF PERSONS ARE
ENTRUSTING THEIR ESTATES TO THIS COMPANY

WHY?

BECAUSE they do not have to fear loss of assets.
BECAUSE they know the Company is impartial and will live to complete its duties.
BECAUSE the administration of Estates in the care of the Company is carried out promptly, efficiently, and economically.

ENQUIRE FOR OUR FREE BOOKLET

ELDER'S

TRUSTEE AND EXECUTOR COMPANY LIMITED
35, CURRIE STREET, ADELAIDE.

DEPARTMENT OF AGRICULTURE.

Bulls that are purchased under regulations of the Dairy Cattle Improvement Act, and upon which Government pays a subsidy, are available, for two years after purchase, to serve a certain number of outside cows.

The following list, compiled by the Department of Agriculture, shows the names of such bulls and of the people who own them, and indicates also the months until which the respective owners will be prepared to make the services available.

As will be noticed, the distribution of subsidised bulls is now fairly general throughout the State; hence, many of those persons, who in the past have found it difficult to get the use of a good bull, should not have much similar trouble in the future. And here let it be stated that everyone of these subsidised animals is a registered purebred and from a dam of proved productivity under Government official test.

The maximum service fee is 10s. per cow.

For the information of cowkeepers, it is pointed out that, although the addresses as given in the following list are those to which application should be made for the services of the bulls, the bulls themselves may, in a few instances, be located elsewhere.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
581	A.I.S.	Highland of Glen Lossie	Mrs. E. A. Haigh	Henley Beach	Jan., 1933
606	Jersey	Para Vale Prince	H. S. Wiese	10, Albert St., Clarence Park	June, 1933
644	"	Oakhill Prince	G. Bain	14, Arnold St., Parkside	June, 1933
650	Friesian	Murray Glen Echo Ashlyn.	H. B. Gogler	52, Charles St., Norwood	June, 1933
667	Jersey	Pella Orlando	O. B. Schmerl	Glynde Rd., Magill	Sept., 1933
688	"	Fernden Skipper	A. R. Johnson	Sturt	Dec., 1933
691	"	Eudunda Rambler	A. G. Fox	Hectorville	Sept., 1933
697	"	Pella Sweet Duke	A. Schulze	Paradise	Sept., 1933
707	"	Kangaroo Flat Jellicoe	R. H. Jones	83, Mary St., Unley	Sept., 1933
708	"	Kangaroo Merry Mike	S. McLellan	Edwardstown	Sept , 1933
710	Friesian	Anama Netherland Pontiac	R. E. O. Osborne	Pirie Street, Adelaide	Sept., 1933
712	"	Anama Maggie's Hero	Glen Legoe & Co.	Waymouth St., Adelaide	Sept., 1933
714	"	Barina Konigen Posch	J. Marrett	Albert Park	Sept., 1933
718	"	Murray Glen Netherland Reuben	D. H. Fewings	Lockleys	Sept., 1933
721	"	Glenowie Hengerval Posch	H. Metcalfe	Enfield	Sept., 1933
731	A.I.S.	Gay Boy of Kiama	H. J. Todd	Findon	Sept., 1933
741	"	Handsome Miller of Illawarra	H. P. McLachlan	Glenelg	Oct., 1933
778	Jersey	Para Wirra Millie's Pylon	R. J. Finlayson	St. Georges	Jan., 1934
779	Friesian	Glenowie King Sylvia	R. C. McHugh	Burnside	July, 1934
812	"	Murray Glen Netherland Griselda	D. Smith	Hectorville	June, 1934
820	Jersey	Morella Sweet Duke	S. C. Bradley	Richmond Park	June, 1934
845	A.I.S.	Kiama Joffre	J. M. Irwin	Hampstead	June, 1934
899	Friesian	Murray Glen Netherland King	A. E. Press	North Adelaide	Sept., 1934
900	"	Glen Murray Pietje Pontiac	Boys' Reformatory	Magill	Oct., 1934
910	Jersey	Para Vale Milklad 2nd	F. P. Smith	Blackwood	Sept., 1934
922	"	Eudunda Damsel's Lord	D. Fitzgerald	Edwardstown	Sept., 1934
927	"	Brinkworth Myra's Repulse	R. and J. R. Goldsack	Glen Osmond	Sept., 1934
572	Ayrshire	West Kilbride Flashlight	W. G. Henwood	Two Wells	Nov., 1932
575	Jersey	Pella Butter Lad	J. K. Angas	Angaston	Jan., 1933
576	"	Pella Rob Roy	B. E. Schutz	Point Pass	Jan., 1933
585	"	Hampden Winnie's Commander	J. H. G. Woitke	Eudunda	Feb., 1933
586	"	Hampden Jessie's King	H. H. Martens	Port Pirie	May, 1933
594	"	Para Vale Milklad	J. G. Kelly	Giles Corner	Mar., 1933
595	"	Para Wirra Colin	K. R. Crewes	Kooringa	Mar., 1933
596	"	Oakhill Silver King	W. H. Durdin	Hamley Bridge	Mar., 1933
597	"	Oakhill Chief	D. T. Angas	Clare	Mar., 1933
605	"	Stonedale Noble	R. A. Dodd	Curramulka	Mar., 1933
611	"	Scrub View Millie's Chief	C. F. Beck	Saddleworth	May, 1933
612	"	Para Wirra Prince	H. Shepley	Two Wells	May, 1933

PURE-BRED BULLS—continued.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
618	Jersey	Para Wirra Dolcie's Pylon.	J. J. Deer	Cleve	Aug., 1933
624	Friesian	Anama Alcartra Botha	A. C. Ford	Kooringa	May, 1933
626	"	Anama Beauty Netherland	C. H. Noll	Wilmington	Aug., 1933
658	Jersey	Eudunda Damsel's Rambler	J. Hickey	Manoora	Aug., 1933
660	"	Hampden Guitar's Chief	B. J. Eckermann	Freeling	Aug., 1933
684	"	Delma Butter King	Mrs. M. I. Neumann	Hampden	Sept., 1933
685	"	Delma Silver Lad	E. L. Shannon	Bagot's Well	Sept., 1933
687	"	Crofton Viscount	J. T. Oates	Kangaroo Flat	Oct., 1933
698	"	Pella Noble Grey	A. E. Lines	Gladstone	Sept., 1933
700	"	Roseworthy Dean	A. W. Griffiths	Salisbury	Sept., 1933
703	"	Burnlea Smith	L. D. Jenkin	Korunye	Sept., 1933
715	Friesian	Barina Highland Segis	P. J. Brady	Barabba	Sept., 1933
717	"	Glen Murray Olda's Crusader	A. G. Johns	Port Pirie	Sept., 1933
723	A.I.S.	Sunnybrook Boronias Victor	H. F. C. Behn	Steelton	Sept., 1933
724	"	The Bluff Waratah's Searchlight	W. L. Shannon	Kapunda	Sept., 1933
725	"	The Bluff Waratah's Limelight	A. H. Buchanan	Koolunga	Sept., 1933
734	Ayrshire	Gowrie Park Scottish Envoy	J. H. Fischer & Sons	Wasleys	Sept., 1933
735	Jersey	Fernden Noble Combination	W. A. Cook	Salisbury	Sept., 1933
737	"	Sweet Haven Mercedes Twylish	T. Roberts	Blyth	Sept., 1933
748	Friesian	Anama Netherland Knight	J. J. Burrows	Riverton	Dec., 1933
750	A.I.S.	Fortune of Dunleith	F. J. Nation	Brentwood	Nov., 1933
753	Jersey	Roseworthy Wiseman	T. Henderson	Hallett	Nov., 1933
758	"	Sweet Haven Prince	V. C. Williams	Salisbury	Oct., 1933
762	"	Hampden Queen's King	G. C. Cartwright	Nuriootpa	Jan., 1934
764	"	Pella Combination	J. S. Holmes	Williamstown	Jan., 1934
767	"	Delma Flora's Lad	F. C. Lindner	Eudunda	Feb. 1934
768	"	Pella Nobleman	C. E. Keller	Wirrabara	Jan., 1934
780	"	Para Wirra Jim	I. C. Worthley	Kangaroo Flat	Jan., 1934
783	"	Para Wirra Bob	E. H. W. Behn	Steelton	Feb., 1934
785	"	Para Wirra Jack	G. Rogers	Kooringa	May, 1934
788	"	Scrubview Lord Twylish	R. W. King	Georgetown	Feb., 1934
789	"	Scrubview Royal	F. V. Dolling	Mundoora	Mar., 1934
790	"	Scrubview Duke	M. H. Modystack	Wilmington	Aug., 1934
798	"	Hampden Mariposa's Noble	H. L. Foote	Mount Bryan	June, 1934
799	"	Hampden Blonde's Quality	A. J. Babbage	Brentwood	June, 1934
800	"	Hampden Olive's Aristocrat	H. Masters	Balaklava	May, 1934
801	"	Hampden Peerless King	W. F. Wurst	Laura	May. 1934
806	"	Eudunda Damsel's Lad	A. H. Marschall	Eudunda	Aug., 1934
817	"	Roseworthy Chancellor	Hicks Bros.	Clare	Aug., 1934
826	Ayrshire	Kyby. Rod	C. Whiting	Snowtown	May, 1934
827	Jersey	Para Wirra Percy	A. J. Marrett	Saddleworth	May, 1934
834	"	Para Vale Prince II.	L. W. Frost	Saddleworth	June, 1934
850	A.I.S.	Sunnybrook Flirt's Victor.	H. E. Krieg	Willaston	Aug., 1934
852	"	Melvin Noble	W. P. Eckermann	Eudunda	June, 1934
853	Friesian	Anama Netherland Jahn	M. C. Bentley	Koolunga	June, 1934
856	A.I.S.	Kiama Royal	J. P. Smith & Son	Tarcowie	Sept., 1934
865	Jersey	Brinkworth Repose	C. A. Ottens	Brinkworth	July, 1934
866	Friesian	Barina Matador Rocket	F. W. Kotz	Emu Downs	July, 1934
869	Jersey	Para Glen Flashlight	C. E. Mellors	Gawler	July, 1934
874	"	Para Wirra Prince 2nd	A. H. Young	Owen	Aug., 1934
882	A.I.S.	Dunleith Lieutenant	E. A. Kelly & Son	Smithfield	Sept., 1934
883	"	Strathearn Haylo 2nd.	L. J. Carman	Undalya	Sept., 1934
884	"	Strathearn Bloom's Searchlight	R. J. James	Riverton	Sept., 1934
885	"	Rivoli Hero	A. H. Frost	Lewiston	Sept., 1934
886	"	Liberton Sutala	J. McCormick	Yongala	Sept., 1934
893	Friesian	Glenowie Netherland Butterboy	L. B. Dean	Morgan	Sept., 1934
894	"	Anama Netherland Joker	E. J. H. Hoepner	Brinkworth	Sept., 1934
897	"	Anama Pontiac Mars	B. H. Hampel	Kybunga	Sept., 1934
905	Jersey	Pembroke Mischief	F. H. S. Hunt	Sandy Creek	Sept., 1934
917	"	Burnlea Echo	D. A. Agnew	Stansbury	Sept., 1934
918	"	Sweet Haven Mercedes Lord	W. G. Johncock	Narridy	Sept., 1934
920	"	Eudunda Glory's Star	M. S. Ferme	Wandearah West	Sept., 1934
923	"	Wooroora Cream Chief	H. B. Scholz	Nuriootpa	Sept., 1934
924	"	Woorooro Trumpeter	J. S. Miller	Auburn	Sept., 1934
931	"	Cudlee Creek Masterpiece.	T. W. Roennfeldt	Greenock	Sept., 1934
933	"	Tuela Senator	R. A. A. Thiele	Julia	Aug., 1934
934	Ayrshire	Angle Farm Richard	A. H. Hewlett	Reeves Plains	Sept., 1934
935	Jersey	Banyule Pylon	W. M. Fletcher	Lewiston	Sept., 1934
946	Friesian	Balaklava Griselda Beets	P. T. Bowker	Laura	Oct., 1934
949	Jersey	Eudunda Flavia's Chief	J. J. O'Sullivan	Tarlee	Oct., 1934
950	A.I.S.	Strathearn Bloom's Cupid.	L. F. Rowe	Cradock	Oct., 1934
672	Jersey	Morella Sweet Duke 2nd	A. S. G. Barrett	Shoal Bay	Aug., 1933

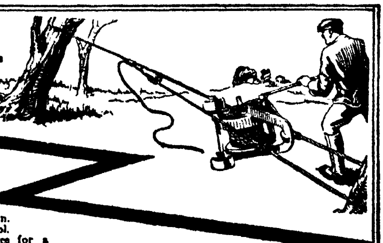
PURE-BRED BULLS—continued.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
629	Jersey	Crofton Highbrow	W. T. Cooper	Arno Bay	June, 1933
654	"	Hampden Flora's Lad	M. J. Edwards	Streaky Bay	July, 1933
740	"	Melvin Noble 2nd	E. G. Hunt	Darke's Peak	Sept., 1933
742	A.I.S.	Karawarra of Illawarra	A. E. and W. T. Story	Elbow Hill	Sept., 1933
754	Jersey	Morella Bill	H. L. Bruce	Kimba	July, 1934
781	"	Glen Valley Watchman	C. F. Jericho	Butler	July, 1934
786	Jersey	Para Wirra Iris's Pylon	H. F. Chilman	Warramboo	April, 1934
848	"	Lanacoona Silver Noble	I. R. Preiss	Cleve	Aug., 1934
849	A.I.S.	Sunnybrook Boronia's James	F. W. A. Du Bois	Wudinna	July, 1934
854	"	Kiama Starlight	W. C. & F. L. Jettner	Yandiah	June, 1934
908	Jersey	Glandore Neat Boy	G. M. McKechnie	Tumby Bay	Sept., 1934
916	"	Burnlea Dandy	A. R. Butler	Ungarra	Sept., 1934
567	Ayrshire	Angle Farm Ayrshire Lad	A. S. Williams	Hackham	Dec., 1932
573	A.I.S.	Molly's Jellicoe 2nd of Illawarra	J. S. Rattei	Forreston	Feb., 1933
577	Jersey	Pella Cleg Kelly	W. A. Mueller	Ambleside	Jan., 1933
578	Ayrshire	Glenrobin Mischief	G. L. Hampton	Echunga	Jan., 1933
582	Jersey	Pella Herd Improvor	J. B. E. Wright	Meningie	Mar., 1933
591	A.I.S.	Melba's Limelight of Northfield	A. E. Cornish	Gumeracha	Feb., 1933
592	Jersey	Eudunda Star of Dawn	G. R. Goode	Narrung	Feb., 1933
602	"	Wooroora Pearl's Cavalier	W. J. L. Thacker	Narrung	April, 1933
608	"	Para Wirra Austin	R. E. Hunt	Bordertown	May, 1933
609	"	Roseworthy Major	G. C. Walken	Mount Barker	May, 1933
610	"	Crofton King Sol	W. F. Medlen	Balhannah	May, 1933
656	A.I.S.	Roger of River View	H. W. Morphett & Co.	Wood's Point	June, 1933
666	Jersey	Pella Majestic Duke	C. Burchett	Meadows	Dec., 1933
668	"	Ontario Millie's Twylish 2nd	W. Rayner	McLaren Vale	July, 1933
669	"	Lord Fancy Starbright of Bruceville	W. F. Nickels	Forreston	July, 1933
670	"	Lallawa Chieftain 2nd	E. H. Gambling	Meningie	July, 1933
671	"	Ontario's Ka's Twylish	W. B. Hay	Victor Harbor	Aug., 1933
673	Ayrshire	Scotswood Fulton 2nd	A. F. Hunt	Pinnaroo	July, 1933
686	Jersey	Delma Admiral	Mrs. B. S. Mills	Wanbi	Sept., 1933
689	"	Oakhill King	R. J. Myren	Ashville	Sept., 1933
690	"	Alinda Mercedes Duke	Mrs. M. T. Halliday	Aldgate	Sept., 1933
693	"	Eudunda Silver Star	D. V. Chapman	Houghton	Sept., 1933
694	"	Para Wirra Maglona's Pylon	Mrs. H. Meers	Kalyan	Sept., 1933
695	"	Sweet Haven Mercedes Duke	G. C. Nicol	Echunga	Sept., 1933
696	"	Brinkworth Judith's Volunteer	E. M. Edwards	Paruna	Sept., 1933
704	"	Burnlea Kingsford	A. L. E. Hoad	Sherlock	Sept., 1933
705	"	Wooroora Bonnie King	J. B. Randell	Gumeracha	Sept., 1933
709	Friesian	Anama Piebe Joe	R. B. Coleman	Balhannah	Sept., 1933
713	"	Barina Matador David	J. H. Thiele	Ambleside	Sept., 1933
716	"	Glen Murray Konigen Butterman	V. T. Bartlett	Murray Bridge	Sept., 1933
719	"	Murray Glen Netherland Butterboy	F. W. Dohnt	Gumeracha	Sept., 1933
727	A.I.S.	Northfield Limelight	Fischer Bros.	Victor Harbor	Sept., 1933
728	"	Strathearn Haylis Haylo	P. J. A. Braendler	Ambleside	Sept., 1933
729	"	Belmont of Kiama	E. H. Coote	Middleton	Sept., 1933
757	"	The Bluff Ensign	R. M. Bell	Murray Bridge	Feb., 1934
760	Jersey	Channel View Makarini's Lad	Mrs. F. V. Wildman	Yurgo	Feb., 1934
761	"	Channel View McEwin's Boy	P. Doceff	Wellington	Feb., 1934
763	"	Balaklava Rhodesian's Repulse	G. V. Rogers	Victor Harbor	Dec., 1933
766	"	Hampden Carnation's Aristocrat	H. A. Woolley	Mount Barker Junc.	May, 1934
769	"	Pella Sly Fox	H. N. Nuske	Tweedvale	Mar., 1934
770	"	Pella Masterpiece	A. L. Betteridge	Mylor	June, 1934
778	Friesian	Glenowie Netherland Triumph	A. McAlister	Jervois	May, 1934
794	Jersey	Crofton Southern Star	H. B. Kramm	Ambleside	April, 1934
795	"	Crofton Silver King	J. H. Wilhelm	Mannum	May, 1934
797	"	Alexandra's Repeater's Volunteer	J. H. Beare	Milang	May, 1934
828	"	Burnlea Alick	S. J. Cox	Strathalbyn	Aug., 1934
835	"	Lanacoona Mercedes Duke	A. B. Rowley	Meadows	June, 1934
836	"	Lallawa Master II.	Mrs. G. G. Bowman	Tailem Bend	June, 1934
846	"	Lanacoona Noble Kelly	W. F. Roads	Inman Valley	June, 1934
847	"	Lanacoona Nimble	Mrs. M. H. Bowman	Dashwood's Gully	June, 1934
861	Friesian	Anama Netherland Paul	K. Lawson	Padthaway	Aug., 1934
876	Ayrshire	Holly Green Queen's Jamie	T. S. Paternoster	Nairne	Aug., 1934
880	Jersey	Lallawa Chieftain 3rd	J. G. Krueger	Sedan	Aug., 1934
881	A.I.S.	The Bluff Waratah's Limelight 2nd	F. H. Rowe	Peake	Sept., 1934

PURE-BRED BULLS—continued.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
887	A.I.S	Sunnybrook Primrose's Pride	H. J. Jagger	Inman Valley	Sept., 1934
888	"	Kiama Pilot	J. B. Kerber	Woodside	Sept., 1934
891	Friesian	Glenowie Netherland Duke	R. G. Magor	Mypolonga	Sept., 1934
898	"	Anama Netherland Dutchman	S. D. Stoddart	Mundalla	Sept., 1934
904	Jersey	Hamley Alpha Prince	A. B. Herrmann	Mount Torrens	Sept., 1934
911	"	Para Vale Pilot	G. W. Woolley	Mt. Barker Junction	Sept., 1934
912	"	Delma Ballarion	W. H. Roper	Strathalbyn	Sept., 1934
913	"	Oakhill Lord Lotus 3rd	A. B. Hartmann	Palmer	Sept., 1934
914	"	Kangaroo Flat Prince	B. McGlinchey	Millbrook	Sept., 1934
919	"	Bernoota Viola's Duke	R. S. Davie	Mount Pleasant	Sept., 1934
921	"	Eudunda Roderick	A. A. Sickerdick	Tweedvale	Sept., 1934
925	"	Morella Digger	A. Anderson	Meningie	Sept., 1934
937	Ayrshire	Denbigh Advance	J. M. Robinson	Meadows	Oct., 1934
633	"	Kyby. Warrior	E. C. H. Schinckel	Kybybolite	May, 1933
643	A.I.S.	The Bluff Planet	A. L. Brown	Mount Gambier	June, 1933
736	"	Flower's Royal of River Glen	T. F. Gratwick	Kongorong	Sept., 1933
739	"	Glen Lossie's Sultan	F. D. Gower	Tantanoola	Oct., 1933
744	"	Sovereign of Kiama	A. H. Allen	Mount Gambier	Dec., 1933
745	Jersey	Morella Anemone's Chief V.	A. Robertson	Struan	Nov., 1933
747	Friesian	Anama Black Prince	G. Northen	Glencoe East	Dec., 1933
752	A.I.S.	Alex. of Kiama	R. P. Wallace	O. B. Flat	Dec., 1933
755	Ayrshire	Kyby. Wallace	A. Slater	Naracoorte	Dec., 1933
756	"	Kyby. Bonnie Dandy	Mrs. A. Watson	Millicent	Dec., 1933
765	Jersey	Hampden Juanita's Aristocrat	F. L. Rees	Glencoe East	April, 1934
782	"	Para Wirra Austin 2nd	Mrs. O. C. Martin	Reedy Creek	April, 1934
863	A.I.S.	Illawarra Bonnie	A. C. Bigham	Mount Gambier	July, 1934
872	Jersey	Para Wirra Pansy's Pylon	J. M. Wray	Hynam	July, 1934
877	"	Gambier Major Twinkler	W. F. Koop	Glencoe East	Aug., 1934
878	"	Gambier Rose Chief	C. R. Davis	O.B. Flat	Aug., 1934
879	"	Selsey Royal	C. R. Kerr	Compton	Aug., 1934
895	Friesian	Anama Alcartra Rex	J. S. McElroy	Lochaber	Sept., 1934
896	"	Anama Netherland King 4th	H. L. Miles	Hynam	Sept., 1934
903	Ayrshire	Kyby. Brat	E. W. Tollner	Mount Gambier	Sept., 1934
906	Jersey	Pembroke Majestic	F. H. S. Hunt	Sandy Creek	Sept., 1934
947	Ayrshire	Kyby. Ivan	H. J. S. Clark	Moorak	Sept., 1934
948	"	Kyby. Bonnie Prince	M. Glynn	Kybybolite	Oct., 1934

TEARING THEM OUT



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PAPERS READ AT CONFERENCES.

CONSERVATION OF FODDERS.

[By A. C. WEBB, Paruna.]

Murray Lands East, Paruna, September 27th.

It is only during seasons of periodical droughts that farmers turn their attention to the all-important question of fodder storage. Many farmers do not give this important matter due consideration from a business point of view. While seasons are bountiful we are apt to forget the bitter lessons learned in drought years, instead of availing ourselves of the opportunity of conserving a reserve of fodders for these lean periods. An important operation of farm activities should be the conservation of fodders of some description.

Taking into consideration the fact that the last two seasons have been very favorable for the storage of fodders, one cannot help noticing the small surplus stocks held in reserve on many farms. There were some farmers, who, owing to financial difficulty, were unable to cut much hay because they had to gather every bushel of wheat to meet their creditors; such a thing should be avoided if at all possible, because it does not pay. Often the remark is heard that farmers have to turn their horses out, at the completion of seeding, owing to lack of stable feed. This is very serious and shows lack of good management; one cannot dispute the advantages to be gained by fallowing as early as possible after seeding is finished. By having to wait until the feed is plentiful enough in the paddocks to start fallowing, the result of the next year's crops will be considerably reduced.

There are various fodders obtainable in this district, that if stored and protected from the weather and mice, will prove valuable in lean years.

VARIETIES OF FODDERS.

The three varieties of fodders generally available in this district are hay, grain and ensilage.

In good seasons the conserving of hay does not involve much expense, because where hay is plentiful it is cheap. The interest lost directly on a reserved stack while good years continue, will not amount to many pounds, but the value of that amount of capital invested, will be many times doubled when a drought occurs. To assure a reasonably good hay cut, more attention should be given to the preparation of land, such as clearing off all stumps, early fallowing, thorough workings, heavier seeding and heavier dressings of super, combined with early maturing cereals and early sowing. I favor small paddocks for this purpose, handy to the homestead if possible.

There are two kinds of hay from which to choose; wheaten and oaten; some favor the former, others the latter, according to their own liking and requirements. For a reserve stack I prefer wheaten hay, cut while the plant is in the flowering stage, and still a good green color, it preserves well and comes out of the stack years after in good order and sweet, providing it has been handled well from the binder, and stacked to at least 18ft. high to the sheaves, with a good roof and covered as soon as possible with straw.

Oaten hay is preferred to wheaten hay for general purposes, but should be cut when the grain is showing a golden tinge. Green oaten hay tends to have a bitter taste and stock will not eat it readily. I do not advise stacking oaten hay for a reserve, the grain being well developed when the crop is cut encourages mice and without a mouse proof fence the vermin soon eat their way through a stack and thus damage the lot. Should one not be in the position to erect a galvanised iron mouse proof fence, then stack wheaten hay cut green.

GRAIN FODDERS.

I favor oats for horses and sheep, barley for pigs, and wheat for poultry. All realise the necessity for oats in crop rotation for the successful growing of wheat, and it provides an opportunity for storing oats for use in lean periods. Storage can be provided in a variety of ways. Usually discarded tanks are to be seen on most farms, these are very useful for this purpose, and are ideal for keeping the grain dry and free from vermin and the ravages of mice. A 3,000 gallon tank will hold approximately 140 bags. Should tanks not be available, the writer recommends storing the oats in bulk in a dry shed; by storing them this way they require only half the space as when stacked in bags, thus saving considerably in cornsacks. Care should always be taken to make sure of retaining sufficient food for the requirements of more than twelve months. The thrifty farmer will also pay attention to the gathering of dry fodders, such as cocky chaff and straw, thus backing up his hay and grain supplies, especially in dry seasons. With a good straw stack on hand, one is then able to cover the reserve stacks of hay promptly, before the roof is damaged.

ENSILAGE.

Now that the farmers of this district—in common with the farmers of other districts—have adopted mixed farming in conjunction with cereal growing, this class of fodder is well worth consideration. The making of ensilage is very simple, only consisting of placing green succulent fodder in a silo, pit or stack, and then weighting it down.

This form of conserving fodder has not been practised by farmers in this district. In other parts ensilage making has been adopted for a number of years, and has proved a success.

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There are two kinds of ensilage, sour and sweet. Although certain modifications of temperatures admit of subdividing these, crops cut when immature, and at a time when there is plenty of moisture, develop more acidity in the stack and temperatures do not run so high. On the other hand more matured fodders contain less moisture, thereby developing less acidity and run to a higher temperature. With higher temperatures there is a greater loss of nutritive materials.

Sour ensilage is considered the best. It should be of a pale green color with a slight acid flavor. Should the material be dry or the weather rather warm and dry, water should be applied to every layer as it is built in the pit or stack. A feature in the making of ensilage is to guard against the access of air, care should be taken to make sure that sufficient weight has ben put on the stack. Success in making ensilage is dependent on cutting the forage whilst still green and succulent, carting the material to the silo or stack the same day as cut, placing at least 4ft. of material each day on stack, completing the erection in 8 to 10 days. As soon as stacking is completed, add the weight.

Stones, stumps, fencing posts or timber prove suitable for this purpose, sand could also be used. The heavier the weight used the better the results, particularly when stack ensilage is being made. The chief feature of this fodder is that it is the nearest approach to green feed and is, therefore, an invaluable food for dairy cows and breeding ewes. Ensilage proves its greatest value in summer and early winter before there is any greenfeed. It keeps the stock in excellent condition and adds considerably to one's income.

COSTS OF PRODUCTION.

[By E. D. SYMON, Loxton.]

There are many farmers who have had a longer experience and have a more expert knowledge of the farming industry than I can claim, and I do not feel that I can contribute anything original to the discussions on farmer's affairs. For whether I have been right or wrong, I have felt for a number of years—before we were troubled with series of droughts or the fall in the price of wheat, that costs of production were perilously high, or if you like, that the margin between costs and prices was very small. Moreover, a situation that is probably going to arise, is that prices will rise and the question of reducing costs will be forgotten. It seems to me to be important that this should not happen. Farmers will have to keep a sharp eye on anything that affects their costs, particularly legislation; otherwise, there is not the slightest doubt that in the future there will be as little margin between costs and prices as there was in the past.

I have no intention of tackling the question of what it actually costs to grow wheat. I wish to base my remarks on the assumption, and I should imagine we are all agreed on this point, that wheat cannot profitably be grown at present prices—there is a gap which somehow or other has to be closed. It may be impossible to close the gap completely. Under present conditions it is difficult to see how wheat can be produced at 2s. 6d., but the probabilities are that sooner or later prices will rise—if they do not then the whole world is in for some very unpleasant experiences. But what the wheat industry wants—and this is a point I would emphasise—that costs should be reduced not merely to ease the present position, but to meet that rise. It is unlikely that wheat prices will make a spectacular rise. What there will be will probably be small. It is, therefore, urgent that as soon as any rise comes we shall be in the most favorable position to produce wheat profitably, pay off some of our past debts, and establish some reserve to replace our plant. That is another urgent aspect of the situation. Many farmers have staring them in the face the fact that some of their plant is becoming worn out. Are replacements to be made at the present level of prices? If implement manufacturers with the assistance of a prohibitive tariff are not able to sell at lower terms than the incredible ones they now charge, it is quite evident that they too want their costs drastically reduced. So far, I hope that you will have agreed with me, that a determined effort to reduce costs is an entirely reasonable attitude. And I cannot help feeling that if some of the energy that has been wasted in clamouring for subsidies of one sort or another had been concentrated on this question farmers to-day might have been in a stronger position than they are. But for the fact that the wheat industry with the wool industry keeps, as it were, the Australian pot boiling, we should long ago have been queued up at the Bankruptcy Court, but it is not a pleasant situation.

To come now to the question of costs. One may divide them up into three sorts. Those controllable by the farmer, costs which may be regulated, to a certain extent, by more scienific farming, *e.g.*, fallowing, improved varieties of wheat, &c. There are those costs determined by the fiscal policy of Australia—tariffs, taxation, &c. The burden of these is difficult to compute, but is undoubtedly very heavy now. And there are those costs more or less out of our control, such as the costs of cornsacks, petrol, and interest charges.

How to Reduce Costs.

In what way can a farmer himself reduce his costs? Imagining his farm not so much as a wheat growing business, but as a general business, he can, of course, become more self supporting by extending his sidelines. Sidelines are often no more profitable than wheat, and that it is just as easy and no more pleasant to lose money by breeding pigs, for instance, than by doing anything else. Cows and poultry seem to offer possibilities at the present time; sheep I regard not so much as a sideline, but as a necessary factor of wheat growing. A point to remember, however, is that no sideline can compensate the farmer for growing wheat at a loss.

Crop Rotations.

There is one way, however, in which a farmer has control over his costs. That is in his method of cropping; he can adopt that method of crop rotation which in the opinion of experienced men is most likely to produce more wheat to the acre. I have divided my farm into three areas, and I intend to keep to fallow-wheat-oats rotation. I hope in the future to be able to resist specious appeals to grow more wheat, and not to succumb to the temptation to abandon this rotation if the odds are in favor of a wet season or a higher price for wheat. For what they are worth I give my reasons for this rotation:—

(*a*) Grow more wheat to the acre by confining wheat to fallow.
(*b*) By regarding the oats as of secondary importance, to be put in early and dry if necessary, one can get all one's wheat in at the most favorable time.
(*c*) The oats should in normal years provide valuable reserves of fodder.
(*d*) The farm should be able to support more cows and/or sheep.
(*e*) The oats would improve the value of the land for wheat.

This rotation implies wheat on fallow and nothing else but fallow. We have often been advised to fallow more, and we know that wheat on fallow produces, as a general rule, a better average than wheat on stubble. For my information, I have kept particulars of the amount of wheat produced by each paddock each year. I analysed these figures recently, when I worked out what would have been the difference had I reduced the area cropped by 25 per cent., making the balance all fallow, and basing an estimate of what the crop would have been, on the average actually obtained, off the fallowed area. For instance, in 1925 I had 25 per cent. fallow and 75 per cent. stubble. Had this area been reduced by 25 per cent. and been all fallow; given the same average right through that I obtained off the fallowed area, I should have obtained 25 per cent. more wheat. In 1926 with 48 per cent. fallow and 52 per cent. stubble, a reduction in the total acreage of 25 per cent. would have given approximately the same quantity of wheat. 1927 and 1929 were drought years, and can hardly be brought into this examination. I might point out, however, that in both years the fallow produced wheat, while the stubble was a total failure. In 1930 there was no fallow so far as I was concerned. The only year in which a reduction in the area cropped would have meant a reduction in the total quantity of wheat was in 1928, when for some reason or other the fallow and stubble averaged exactly the same. This, however, is an exception, and on the face of it, it appears as though a reduction in acreage, with wheat only on fallow would mean at least an equal quantity of wheat. With some farmers I am sure it would result in more wheat. In any case it would mean more wheat per acre, which I believe is what we want to achieve.

I have touched briefly on these points—crop rotation and fallowing—because they represent about all that a farmer is able to do in an effort to put his business on a sound basis. And it is little enough. There are few farmers who have not cut their costs to the bone and are now farming as economically as possible. What then can we do? Obviously when we have done everything possible to economise, to practise farming on sound lines, and to keep our creditors at bay, we have to turn our attention to those costs which are imposed on our industry by policy or by legislation. I should like to mention one tangible reduction in costs, and incidentally the only one which has so far come to farmers, and that is the reduction in interest. It is to be hoped that in the near future there will be a still greater reduction, and so ease one of our biggest burdens. It is interesting to note that some implement firms are still unable to see the justice of passing on the reduction which they have obtained themselves to their customers, and still claim 10 per cent. Nothing but an Act of Parliament would make them reduce their 10 per cent., and I am convinced nothing but a little genuine competition will ever make them reduce the prices of their products.

It is perhaps not possible to estimate accurately the burden which the monstrous accumulation of indirect taxation and a prohibitive tariff lays on a bankrupt industry. I remember that some years ago a committee of economists put the effect of the tariff at 10 per cent. of prices. It must be much higher now. [Note.—This committee estimated that if the burden of protection were lifted from the farmer he might hope for another 7d. a bushel. What is it now, plus the indirect taxation?] I do not know what the latest figure is—perhaps 20 per cent. or 25 per cent. When you consider that the total removal of this burden—I am not suggesting that that is practical—would bring a payable price for wheat almost in sight it seems astonishing that so little effort is made to bring about some useful adjustments. Yet it is so. And so far from the upward movement being checked, the position is the reverse. I note, for instance, that a plough part for which I paid 25s. last year is 30s. this year; next year with luck it will be 35s.

This problem—the problem of how to call a halt in his ever-increasing costs—is one of the most important questions a farmer has to face. And I might say, has been for a number of years. We have to try to produce wheat at such a margin of profit that we can pay off some of our arrears and establish a reserve for the future. But if we cannot do this, at least we can aim at keeping our industry going without the dubious varieties of assistance that are usually demanded. It seems incredible that no definite effort has been made to assist one of the basic industries of Australia along the lines of reduced costs. The only efforts so far to assist us have been in the nature of Acts of Parliament, such as the Farmers' Relief Act, to ensure that somehow or other someone kept on growing wheat; and by the Federal bounty.

I am not suggesting that costs can be brought down to the present level of prices, or even that it is desirable to do so. Yet it is beyond all reasonable doubt that much could be done to put the wheat industry on a sound basis, if there were the will to do so. But of that there is, unfortunately, no evidence whatever. However pleasant it may be for the individual farmer to receive a bounty for his wheat, or to dream dreams of an Australian price for wheat, or to take part in agitations for a sales tax on flour or to sow his wheat with subsidised super, his fundamental insolvency remains. If the insolvency of wheat growers was due entirely to the fall in prices, one would have to regard it as an act of God and put up with it. But it is not so. Some years ago an accountant told me that of the hundreds of farmers for whom he compiled income tax returns, only two or three were, from an accountant's point of view, growing wheat at a profit. And this was before the fall in prices.

I have criticised this aspect of the situation, perhaps more mildly than it deserves, because I think that farmers themselves must bear some of the responsibility. Confronted by a problem on which you would think farmers would be unanimous, their energies have been wasted on useless and generally impossible schemes. As an example, let me mention the latest, the proposal to subsidise super. Altogether apart from its merits what probabilities has the scheme of being adopted? Personally I should not like to put much money on it.

So far all that I have said must have been only too painfully obvious, yet unless some sort of action is taken it is quite clear that the situation will drift, creditors, farmers, and manufacturers pinning their hopes to a miraculous return of high prices, comforting themselves in the meanwhile that the corner has been turned, or if it has not, it will be in a few moments.

ORGANISED PROPAGANDA.

There is one question I will put forward. The wheat industry is not a highly organised industry like the sugar industry or the secondary industries. It is essential that it gets public opinion on its side. To do this it must engage in an intensive propaganda. It must educate public opinion, it must try and educate politicians and incidentally it must educate farmers themselves. It should advertise its facts, its figures and its disabilities in the press day after day, in the same way that the sugar industry keeps its affairs before the public. It should publish the results of inquiries into the effect of the tariff, and if necessary, undertake more research in this direction, and it should so keep itself in the public eye and ear, that the authorities are finally compelled, by sheer exhaustion, to give the same amount of consideration to the wheat industry as is given to every little secondary industry which cares to establish itself in Australia.

How is this to be done? First of all, I suggest that all organisations which represent farmers should abandon controversial items in their programmes and concentrate on this question of costs. When we have grown our wheat at a heavy loss, the question of

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whether we should pool it or not is irrelevant. The organisation having done this, the farmer should submit to a small levy on his wheat to pay the expenses of the campaign which I have suggested. Incidentally, I should like to see a paid professional organizer in charge. Of course, no doubt, a certain proportion of farmers would not agree to such a levy—would think that their money was being wasted, and would pin their faith to more subsidies and bounties. Like the French nobleman who declared when the old monarchy went bankrupt "When others hold out their hands, I hold out my hat." I can personally see no other way of dealing with the present state of affairs; and the fact that at Ottawa, Australia's tariff policy was advertised as "unchanged," makes action on our part imperative.

For some years wheat growers and other primary producers have faced a period of unprecedented low prices. Both individually and as an industry they have suffered a severe strain. Nor can anyone deny that they have made every effort to cope with an almost impossible situation. They are, however, still selling their products in the world's market, and in one way or another have managed to keep going. It is astonishing that wheat growers, in spite of the almost hopeless conditions under which they have to carry on and the contemptuous disregard of their real needs, have kept going so cheerfu'ly and philosophically. The years 1927 to 1932 have brought droughts, low prices, and increased costs. There are few farmers who, if they could have been told, say in 1926, of what these years were going to mean, would have believed that they could have survived them. Yet it has been done and wheat is being produced, and farms are being managed, more efficiently than before. In other words we are still here.

I cannot help wondering whether our secondary industries, if faced, perhaps not by the full blast of world competition, but by a gentle breeze, would be ruined as quickly as they expect to be. I cannot help thinking that if they met such conditions in the same spirit and with the same fortitude as farmers have met theirs, they would still be there too.

"The authority of a Government can only be maintained by taxes; all taxes must, at last, fall upon agriculture; and agriculture can never flourish except under the protection of justice and moderation."

That statement was made 1,700 years ago. It seems as true to-day as it was then. It should be our aim to spread the truth until it is generally realised and acted upon. I hope, however, that it will not take another 1,700 years.

THE VALUE OF EXPERIMENTAL STATIONS TO SOUTH AUSTRALIA.

[By R. PENGILLY, Alawoona.]

The recent closing down of experimental farms leads one to consider whether or not such a policy is really an economical achievement, or a backward step in these times of progress; when the scientifically minded farmer is the one who is more certain of a return for his labour than one who does not take advantage of available information. The State has been and will continue to be for generations hence, dependent on the primary producers for its wealth and revenue, because the realisation of the world's wheat harvest, and income from other primary products is vital to the government, to administrate the affairs of the State.

Farmers in the past few seasons, through droughts and world depression, have suffered and held out against greater odds than people in the city realise. Droughts reduced the wheat harvest for three successive seasons and when climatic conditions became more favourable, with the end of the succession of droughts, prices slumped to unthought of levels, so that the prospects of speedy recovery appeared pretty hopeless.

On the surface, the apparent losses that occur in connection with the running of experimental farms, seem very heavy, especially when published, are without a doubt, only one side of the question seen from one angle.

One cannot pay much serious attention to this side of the matter without taking into consideration the many other aspects of the matter which need careful thought.

Experimental Farms are first sources of education to the primary producers, on whom the country is dependent, and it is only reasonable to assume that the educated and scientific man is the most efficient man. Efficiency naturally results in better work and great production, and any increase in production, no matter how small, is of benefit to the producer and therefore the State. I have heard it said by some people ''Why not let the farmer do his own experimenting'' but these people do not realise the tremendous amount of work, and costs entailed in carrying out even one separate experiment, much less the number, generally in hand on any Experimental Station. Further, it is only occasionally that an experiment results in an unqualified success, and hundreds of expedients one tried out before the objective in the minds of the experimenters is perhaps achieved. The ''trial and error'' system of procedure is the only method possible with experimentation, and naturally all atempts that fail to reach the desired objective are a direct loss of time and money to the eye of the casual critic.

Such failures however, are far from losses, when the experience gained by the attendants, and knowledge gained on a better method of procedure for the next attempt is considered. It is true that on experiments and trials that prove failures, there is little or no tanglible return, but often the objective when reached after hundreds of false starts, more than repays the cost of previous failures. As an example, the various work to be done in the breeding up of a new variety of wheat at a typical experimental station, from the original selection or crossing of varieties to the distribution of the new variety to producers can be cited.

In the first season, the actual cross between the two parents is made, and the maturation of seed from this cross takes up the first season. The following season these crossbred seeds are sown and at harvest time the process of selection and demonstration of the breeder's skill comes into play. He has to select carefully the most promising types from a host of differing plants and probably only two or three per cent. are retained, and the rest discarded. The third generation is next handled, the seed from the second generation being planted, and a further process of selection of suitable types, carried out before obtaining seed for the fourth year.

In the fourth year this seed is sown in small plots and submitted to field tests, which may result in a small or larger percentage being discarded according to whether the results of the tests are satisfactory or otherwise. In the fifth year, larger plots are sown with the fourth generation seed and further tests and selection take place. It then takes one or two years more of trial and tests before the variety is deemed fixed. The small amount of seed has then to be multiplied in stud plots, and then bulk multiplication plots before sufficient seed is available for distribution to farmers.

Thus it takes from six to ten years or more to develop a new variety of wheat, provided—as is often the case—that the new strains do not have to be rejected at some stage or other before the task is completed. So it may be seen that such an undertaking is beyond the limits of the time and patience of the average farmer, who has dozens of other things to occupy his time, besides taking the ever-present risk of partial or utter failure. Time means money, and the average farmer cannot afford to lose either time or money in hazardous undertakings which may or may not bring in a return.

Experimental farms do not confine their attention to wheat breeding alone or any other selected experiment or trial. As an example, I enumerate some of the experiments being carried out at Roseworthy College:—1. Rotation plots: comparing various rotations of crops. 2. Manure variety plots: trying out nine different manures on wheat. 3. Superphosphate plots: different dressings of superphosphate on wheat. 4. Depth of ploughing tests: different depths of ploughing from 2in. to 12in. 5. Tillage plots: 15 methods of fallowing. 6. Time of seeding plots: wheat sown, May, June, July. 7. Rate of seeding plots: 60lbs. to 100lbs. per acre. 8. Methods of pickling: formalin pickling tests. 9. Pasture top-dressing plots. 10. Lamb breeding experiments, &c. Few people realise the amount of information that is really available from these trials, but the authorities do their best to bring information to the producers, through reports and bulletins. It is the farmer who is to blame if he does not take advantage of these, chief among which is the Bureau as a means of disseminating this information.

Arguments have been put forward urging that numerous and scattered Experimental Farms should be done away with and the work carried out at a central station instead. The necessity for Experimental Farms in typical areas is that the climatic and soil conditions vary so much and naturally agricultural practices and methods differ. Moreover, each typical class of country has its own problems and difficulties to overcome. A tremendous amount of labor is necessary on Experimental Stations because of the hundreds of small jobs which need careful and individual treatment.

I have tried often to convince city people that the farmer must have a useful knowledge of a dozen or more trades in addition to the actual business of working his land and raising crops or stock.

The average farmer is dependent on himself for the execution of a host of jobs, one of which could probably only be done by a city tradesman. Is it fair that a farmer should be denied the right to benefit by the knowledge of men who have been better educated than he in order to work out the scientific experimental work on Experimental Farms? Government Experimental Staions are in charge of men who have had an education fitting for their work, and which has often been unobtainable to the average farmer, and thus farmers should be able to leave the actual experimentation and trials to men and equipment better suited to the work and be content to put to good account the results from the experiments when made available for him.

Finally, the large figures reached by the costs of such Experimental Farms are often cited as being a justification for their abolition, but every ½bush. added to the yield of wheat, every little increase in quality of stock, every method which improves on previous methods, means much more in hard cash to the State, than the cost of running the Experimental Farms which bring about these improvements. An increase of a bushel of wheat per acre on Australia's wheat yield means an addition of £3,000,000 to the nation's income. If the butterfat production of cows can be only improved by 10lbs. per cow per year it would mean an additional income from production of £2,000,000.

Of the 13 most popular wheats in South Australia, seven are Roseworthy wheats. It is reasonable to assume that these wheats are at least half a bushel better in yield than those whose place they have taken, and on this assumption the net profit to South Australia through cultivation of College wheats is approximately £100,000 per annum, which is many times more than the entire expenses of the College, and this results from only one branch of the College activities. That is an example which shows that such institutions deserve their place in the State, as does anything which aids primary producers in the carrying on through the depression.

CO-OPERATION AND THE AGRICULTURAL BUREAU.

[By P. R. Hodge, Secretary Taplan Agricultural Bureau.]

The word "co-operation" is a splendid one and has a power of meaning. It is found in the titles given to some of the greatest organisations in the world, and when applied to any movement whatsoever invariably means success.

Work of Bureau and Department.

A striking example of the power of it is in our Agricultural Bureau system, which is no less than a great co-operative organisation and one of which we should feel proud to be component parts. Who can put forth arguments against this great movement and justify them with any degree of reason? When we think of the wonderful work done by the Department of Agriculture at the various institutions in the State and the knowledge imparted therefrom through the *Journal of Agriculture* and other channels to any one who wishes it, for a nominal charge, there can be no reasonable argument put forth that the Agricultural Bureau is not one of the best friends the primary producer knows.

Help for the New Farmer.

How many men, taking up farming with perhaps little or no previous experience, or going into a district where conditions of farming are entirely different from what they have been used to, have had the Bureau to thank for information which they required. There are many cases of men acquiring farms in a heavy land district when possibly they have always been used to country similar to our own, or *vice versa*. What is the easiest way for such a man to obtain the necessary information? The answer is, to join the nearest Branch of the Bureau and listen to the papers read and discussions following, and the views of not only possibly a neighbor, but several farmers of the district are heard. By doing so, different opinions are obtained, and here the word ''co-operation'' comes in again. When farmers meet together and discuss the various problems and reach a deadlock in connection with the trouble confronting them, further free and expert advice can always be obtained from the Officers of the Department of Agriculture who make a study of such problems.

Individuals Cannot Experiment.

The average farmer has not the time to put into the experimental work to overcome these various difficulties, and here the experimental institutions come to our assistance. These places, on the other hand, are helped considerably by the co-operation of the farmer as, for instance, in the matter of forwarding specimens of diseases found in crops, soil troubles, or animal diseases, &c. This work is usually done through some Branch of the Bureau, whether the person desiring the information is a member or not. In any case, the advice given is always from the Department, and that is ample reason why every farmer should recognise his duty and join some Branch of the Agricultural Bureau.

Pass on Your Knowledge.

Even should he be fortunate enough to be sufficiently educated in all branches of his calling to need no further advice, what could be more reasonable and neighborly than

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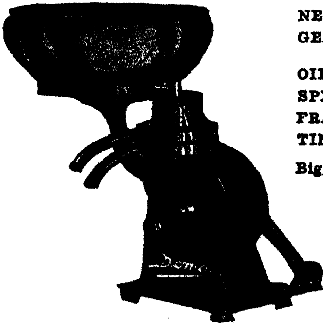

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for him to give the benefit of his knowledge to someone else less fortunate? The local Branch of the Bureau is what the residents make it, and the meetings can be made as attractive as the members care to make them.

I am a firm advocate for co-operation in the working of our farms or any other line of business in which we may be engaged. He is a fortunate mallee farmer who has never found it necessary to borrow from a neigbor, nor had to ask for help with some special job in hand. Pounds can be saved by neighbors co-operating with each other. As, for instance, in the loaning of an implement or by helping each other when laborers are not available, possibly for such jobs as chaffcutting or other two-men jobs, much of the labor difficulty can be overcome.

In the matter of drift and other bounadry fence troubles, the co-operation of neighbors concerned will save endless arguments and considerable ill-feeling, as a seemingly impossible job is made to look simple by discussing the matter and getting to work as one man.

Co-operation between employer and employee is a splendid thing, and makes the work much more interesting and very often more profitable to all concerned. Unfortunately, however, too many men nowadays apparently think only of the remunerative side of the job, and co-operation is foreign to them.

SOME OBSERVATIONS ON BUREAU MEETINGS.

[By A. N. McKenzie, Taplan.]

I have long felt that many Bureau Branches fall short of their aims. This is chiefly due to a general lack of interest and to a want of knowledge of the facilities which are at the service of Bureau members. Generally speaking, Branches are showing signs of a revival of interest, and these suggestions are put forward to cultivate that interest.

Membership.

Every farmer in a district should be a member of the local Branch of the Bureau. While this is not practicable to that extent we fall far short of it, and we might easily increase membership if every member were to talk about the Branch, its meetings, and the advantages of membership, and so persuade others to join. The individual has the help of his fellow members, and the experience of the Departmental Officers as well as the results of scientific investigation at his call. Then the district gains greatly if all the farmers are working in accord, and so improving their farms and boosting the district.

When new members have been obtained it then falls on the Branch to retain their interest and membership. This can only be done by making the meetings interesting, instructive, and sociable. The following few suggestions, I believe, will help to obtain that interest in our meetings:—

Papers and Lectures.—The reading of papers by members is a very good idea if it provokes discussion afterwards, but that does not carry us far enough. To complete these we should have lectures by the Departmental Officers, so that some finanlity might be reached upon important questions. However, before we can expect the Officers to visit us we must show them that we are a live and interested Branch.

Use of Facilities.—As a body we should make more use of the facilities offered to us. We seldom carry our problems to the experts for explanation or solution, yet we pay them for that purpose. How few of us know what is being done at the Waite Research Institute, yet there we have a most up-to-date institution, and one which is visited by the leading scientists of the world when in Australia. There we have specialists at work in their various departments solving problems for the primary producer, who very often knows nothing of it because he does not take the *Journal* or the pamphlets issued by the Department of Agriculture. We should keep in touch with these institutions and with the results from Departmental experimental work. An outstanding example of this is the work with the pastures at the Kybybolite Farm.

Items of Interest.—Members can create a great deal of interest and enthusiasm by introducing items of interest such as experiments and experiences in pickling, sowing, cultivation, &c., and also by bringing along their problems and mistakes. If a farmer does make a mistake he should ensure that no one else falls into the same error.

Exhibit Night.—I noticed a report of a Branch which held an exhibit night on which members brought along various gadgets and makeshifts which they had made themselves. This appeals as a good idea, both to create interest and to pass on ideas gained during the year.

Harvest Reports.—In many Branches after harvest a night is set apart for harvest reports. During this evening farmers give reports on their best and worst crops, and if possible, give reasons for their success or failure. Farmers tell each other these facts outside, so why not make them useful to everyone by stating them inside at the meeting?

Homestead Meetings and Tour of the District.—By far the most effective meeting is the homestead meeting where the lecture or paper is accompanied by a demonstration. These need not be confined to the visits of the Officers of the Department, but could be held whenever a member wishes to give a paper on something which he can demonstrate on his own or someone else's farm. A variation of this is a tour through the district when the crops are standing and a discussion held on the merits of crops, method, &c.

Crop Competitions.—Every Bureau should foster crop competitions. These are undoubtedly a good thing both for the farmer concerned and the district. One notices that places which take their Crop Competitions seriously get much more publicity than those which do not. This has an undoubted influence on the district, and has an effect on the finance of the district in respect to confidence, &c.

DEVELOPMENT OF MALLEE FARMS.

[By F. MASTERS, Roberts and Verran.]

(*Kimba Conference, October 3rd, 1932.*)

Of the millions of acres of arable land on Eyre Peninsula, probably not more than one-sixth has yet come into production, and therefore there is much developmental work to be done, and consnderation of factors affecting the development should prove of interest and profit.

Much of this new land still remains upon occupied farms, while a smaller portion is mallee land still untouched, awaiting brains, brawn, and energy.

The first essential is capital, and here usually the new settler is handicapped. Had he sufficient he could purchase a cleared farm and avoid the risks of pioneering work. Generally speaking, the settler in the mallee is one with limited finance, and this fact alone calls for adoption of shrewd planning and management, as he finds it necessary to refrain from expenditure. Hence, the subjugation of most mallee farms becomes a long drawn out process. Finance procurable is from the State Bank under Advances to Settlers for sheds and tanks, and clearing and fencing purposes, or alternately in regard to the latter through the local district council if there be one in the locality. Of course, prior to that the settler must have either stock and plant, or money sufficient to purchase, and the better his equipment the greater likelihood of success. I have known cases where settlers have started without capital, stock, or plant, and eventually made good, but here it is a case of individual judgment, management, and tenacity, which it indeed also true in any case, as we find on the other hand failure coming to men with capital, and good stock, plant, and equipment. After all, mallee farming is a profession, and cannot be learnt except by long study and experience, and to place city bred men on these farms without proper experienced control would be sheer madness. Many a would-be settler has failed because of inexperience, and lacking the power to adjust himself rightly to his new environment, and profit from experienced neighbors, while it must be said that those of this class, having capacity of adjustment, and by using the advice of experienced men, have successfully developed a mallee farm. The vocation is full of problems; circumstances vary with the seasons, and differing amount of finance, as well as varying prices and marketing difficulties, call for the highest resource and initiative, so that mallee farming demands the highest of these faculties to succeed.

Clearing.—The farmer has to determine the area possible, whether tractor, horses, or bullocks will be employed for the purpose, and have it done in a suitable time ready to burn in the season. A good burn is the desideratum, and it should be rolled or logged sufficiently early to allow the timber to dry. This will avoid undue expense of stick picking, &c., and make for a better crop. Patchy burns mean patchy crops. From year to year, until the farm is cleared, this process has to continue in areas according to judgment.

Cropping follows, and much depends upon cultural methods, time of seeding, varieties of wheat, oats, and barley sown. Also treatment of seed to prevent bunt, smut, &c., and the method to be adopted. It is easy to err and sow too early or too late, select an unsuitable wheat—say late wheats for early districts, and so on with oats and barley. Errors of judgment are costly and should be avoided.

Plant and machinery make or mar success, likewise their economical use. Here the potent factor is finance, as requirements frequently have to be cut down to an uneconomical basis. For small areas it is questionable whether a full kit of implements and machinery should be purchased. Better make some arrangements with others similarly situated than overload in commitments on machinery. If this cannot be done the settler works at a disadvantage. The essential point with implements and machinery is to have them worked at full capacity, and if this can be secured means a step onward to success.

Labor dovetails in with machinery, and some few years ago the premium on labor was such that farmers were forced to displace it as much as possible by machinery. Even now with the unemployment existing, we are forced to follow those lines. One man can handle a large implement or machine as effectively as a small one. Family labor has frequently meant the difference between success and failure, but this does not mean that labor had not been remunerated. It may have been delayed, but eventually paid in assisting starting the family elsewhere. To-day many farmers cannot employ owing to drought and other encumbrances. Better than unemployment relief, to spend that money in assisting in developing mallee farms, and incidentally, training men for primary wealth production.

Water provision must be made early and from time to time as required, by dams and tanks, unless the settler is fortunate enough to have water laid on. The latter is preferable, as being permanent and also cheaper, as well as not absorbing time, labor, and money in the earlier stages when clearing and cropping are most necessary. I rather incline to the opinion that the Government should provide the reticulation of every farm in national and individual interest.

Stock raising, as soon as water supplies are assured, should be practised. It necessitates fencing and yard provision, &c., but no expenditure is more warranted in view of the returns likely. Mistakes are frequently made by fencing the whole of a scrub block right away, as such fencing earns nothing and is menaced by fire. Refrain from such useless expenditure. In the earlier stages, and, indeed, always understock. Feed should be sown for sheep, cattle, and pigs, and stores of hay and ensilage placed by against lean times. Relatively the labor costs of livestock to returns are lowest of all farm operations. Depreciation should not take place, but stock are notable for their appreciation in values provided food and water are plentiful, and become the anchor of a mallee farm. The selection of the flock should be Merino as a base, and crossbred for production of fat lambs for export.

The fat lamb business means producing them in the season when feed is plentiful and turning them off before supplies diminish to the advantage of the ewes for a succeeding crop of lambs. If kept for wool only care must be taken to grow the progeny, and less can be carried.

Dairy cattle, of milk-producing capacity, should be kept, and each cow's milk weighed and tested regularly. Thus a high producing herd can be built up with certainty, where to-day the haphazard methods followed diminish the returns and no profit results. To grade up a herd I commend the Government bull subsidy scheme as making it possible and potent.

Pigs should have their place on every farm, utilising waste and turning grain into greater profit. Even with price of bacon at 4d. and foodstuffs all purchased it has been proved that a profit of 1½d. per lb. can be made. With farm-grown grain the results should be greater, when the saving in bags and freight is considered. Freight on the hoof is cheaper than in bags for such grain, and this applies also to cattle and sheep in connection with foodstuffs fed.

Poultry likewise assist in the development of our farms by converting grain to other products. The sooner the new settler can devote his attention to these sidelines the safer the basis of his operations.

Efficiency should be the keynote of all operations as promoting lower working costs. It is essential that the costs of production be reduced wherever possible through this factor. Prices of all our produce have receded considerably, but prices of production have not anything like the same ratio. It is our business to see that they do, so far as we are able. The running of our tractors on charcoal gas promises toward this end, but their original cost still remains too high. Likewise all machinery and farm requisites, cornsacks, &c., are relatively too high. These are factors which operate outside and over which we have little power, but we have the right to register our emphatic protest and demand efficiency in manufacture and distribution. Machinery duplicates are too costly. Recently a bottom comb and steel riveted on mouthpiece of my chaffcutter cost me 17s. 6d. (about three pounds of cast iron, and a small hardened plate altogether), a hide is purchased at from 3d. to 4d. per lb., but my leather costs me 2s. 9d. per lb. Can the difference be defended?

These are illustrations of what is going on and we have a right to ask for investigations as to whether manufacture is efficient and charges justifiable seeing the mallee farmer has to reduce his costs of production. It is imperative that each mallee farm should continue to develope and provide export trade as well as local, but this can only be done on right lines demanding our best judgment, resource, intiative and energy. We have made many mistakes in the past and experience and expert advice from the Agricultural Department should largely prevent these if applied. As to tariff and manufacturing costs, their effect should be determined and adjusted in our interests and the interests of the State.

The development of our mallee farms to the fullest extent is, I believe, the economic salvation of the individual and the State, and suggestions that they should carry 1 sheep to the acre without reducing the cropping area is a worthy ideal given by Professor Perkins.

Marketing our produce to best advantage is deserving of our best attention. After all the expenditure of time, thought, and money producing to the utmost to have the value reduced by faulty methods of marketing, excessive freight as well as other charges and profits are militating against proper development of mallee areas.

The direct shipment from Eyre's Peninsula of its products to the place of sale is of first importance. In this connection also direct shipment of all our requirements would reduce their cost. The centralisation of trade in Adelaide of our produce and requirements costs Eyre's Peninsula a huge sum annually.

Whether alterations in our methods of disposing of our production, such as bulk-handling of wheat, developing the infertile egg sales and dealing with them and all sidelines here are matters worthy of discussion. What it means to have manufacture of super. here is evidenced by a reduction of about 10s. per ton on that article all round. Marketing on a co-operative basis appeals strongly to me, but I realise that to be most effective it must be hundred per cent. business. Should not the farming industry control its methods of marketing and a majority decide those methods?

DAIRYING IN THIS DISTRICT (KIMBA).

[By A. Jericho, Balumbah.]

(*Kimba Conference, October 3rd,* 1932.)

Some years ago I set myself the task of writing on a similar subject, and among other things, stated that where a man had all his paddocks sheep-proof fenced, it was not profitable to keep more cows than were required to supply milk and butter for the household. At that time wool was realising £40 a bale and wheat 15s. to 16s. a bag; but since wheat and wool are back to normal, we must look to other sources of revenue to make up the deficiency in capital we have to handle throughout the year.

Dairying comes next to wheat and wool, and the available labor will play an important part in placing the credit balance on the right side of the ledger. I do not advocate any particular breed of cow for this district, suffice to say we have men in South Australia specialising in the different breeds, and some of them possess stock that would not be a disgrace in any part of the world. These men have spent a considerable amount of money in building up their herds, and are entitled to their reward; but to pay them for their enterprise is above the average farmer's pocket, therefore, we must look to other ways of improving our herds that are within our reach.

I advocate line-breeding. Ascertain which is the best cow in the yard, and make her the foundation cow of the herd to be. To improve some of the herds in this district probably three different sires would be wanted in the one year; because the herd consists of so many different types of cows which also possess so many different qualities. It is not a life's work to get a line of cows. In 1926 I purchased a heifer calf, and to-day, six years later, I have seven cows and heifers from that one heifer. A farmer could gradually turn out those lines he does not wish to follow up, and eventually have the one line in his herd.

Having accomplished this, it is an easy problem to purchase a bull to improve the herd. If unable to purchase a bull, always try and secure the service of the best bull in the district, but do not expect it for nothing, because a good sire costs money, and if the owner does not get full term out of him he is going to lose heavily. A scrub bull is allowed to roam about until he gets savage or develops some other vice, and is then turned into beef, and the owner gets full value. Having a fixed object in view on breeding the farmer must pay a little attention to the growing stock. The calf should be taken away from its mother as soon as convenient and artificially fed on good milk for a week after that. Gradually add a little separator milk and scalded linseed meal. If the feeding vessels are kept scrupulously clean, failures will be rare.

After a week get the calf on to green feed or chaff and after a month or so it can be trained to walk out with the cows. It is a good practice to allow calves and young heifers to come home every night and be shut in a separate yard during the milking. When the heifers show signs of freshening, rope and handle them. After a few handlings they become very quiet. When near calving, watch them closely, and when the milk flow appears, milk regularly whether she has calved or not. Even with this attention you will find the heifer restless after calving when being milked; but not one in ten will kick viciously and by gentle and careful handling—usually a couple of days after calving—she will settle down. Wet milking causes about 80 per cent. of the restless "kicking" cows. It is essential to watch all the cows before calving and milk as soon as the flow starts. Always feed the best of everything. I always turn my cows into a different paddock of green feed (when available) at night to where they have been through the day, and encourage them to drink twice a day. About twice a week feed phosphate lick with some dry feed in a nose bag. Finally, all work with the cows should be as regular as possible.

In reply to a question, Mr. H. B. Barlow (Chief Dairy Instructor) stated the pollard could be used successfully to replace linseed meal. Calves should be brought on to linseed meal gradually, as otherwise it was likely to scour them. He disagreed with Mr. Jericho in advocating milking before calving. This should be done only when the heifer or cow appeared to be abnormally in pain and then to a limited extent, merely to ease the milk supply. Milking before calving was dangerous, as the cow was likely to develop milk fever by this practice. Again, cows should always have access to drinking water, as the more water they drank the greater would be the production of milk.

FARM RECORDS.

[By F. Galloway, Kimba.]

(*Kimba Conference, October 3rd,* 1932.)

I have lived amongst primary producers, principally farmers and fruitgrowers, for the greater part of the past 12 years, and one of the first things that always comes to my mind, which, being an accountant, probably may be in a more or less biased state, is the seeming lack of attention paid to that side of their business which I regard as of the utmost importance. I refer to the accountancy or, to put it in a more applicable way, "records" side of any primary producer's business.

The records that I propose to touch on require no more than common sense, the ability to read and write, and a passing knowledge of figures. The records, after all, are not for the Income Tax Commissioner, the banker, or for anyone else, but yourself only, and so long as all the information you desire is readily available, the simpler the record the better it is.

Naturally to a farmer the paramount record is that of your principal product, grain, but the mere fact of being able to say that "I have had an average of 1,500 bags of wheat for the past 10 years," amounts to nothing at all. What you want to be able to say is, "Ten years ago I grew 1,500 bags of wheat, and now I am growing 2,500 bags of wheat off the same area," and one of the ways which will help you to be able to say this is to keep a suitable book, not just a paper-covered note book, but, say, a journal, with stiff covers, which is obtainable at most stores for a few shillings, and in that book set aside sections of say, 10 or 12 pages for each of the items which it is intended to record, so that each particular section is kept together from year to year, and not mixed up in a few pages, and eventually neglected altogether because it is not possible to make head nor tail of the thing.

Each farmer has his particular lines of which records are necessary, but to cover the ordinary case I would suggest the following division as being sufficient:—1. Grain, including wheat, oats, fallow, super, stubble, &c. 2. Hay and fodder. 3. Horses. 4. Machinery (farming plant). 5. Tractors and fuel. 6. Motor cars and truck. 7. Sheep, wool, and lambs. 8. Cattle, pigs, poultry, &c. 9. Weather. 10. Income. 11. Expenditure. 12. Budget.

Grain.—Keep record of total area sown each year, class of ground, *i.e.*, fallow, stubble, grass, &c., and area of each. Time of seeeding, amount of seed and super per acre, time of fallowing and number of times worked over, time reaped and result of crop, &c., &c., showing result of crop first as total amount and then show the average per acre off each class of ground and finally the general average. At one side of page you should leave a space for notes and there write down (do not keep it in your head) your impressions as to the cause of the success or failure of the crops. Such things to be noted would be:—"Frosts third week May," "Season opened June 5th," etc. Write these records down as soon as the information is available.

Hay and Fodder.—Keep a record of hay and fodder harvested and used. Note areas from which it was taken. Note down the year's price of hay and any other relative information which may be of use.

Horses.—Keep a record of all horses purchased, showing dates, prices, &c. Note when foals are dropped and note all sales and prices realised. This record will be of interest and show exactly where you stand with regard to your horses and what they are worth to you.

Machinery.—Keep record of each machine and show date purchased, approximate area covered each year, cost (if on hire-purchase, allow for interest), cost of repairs and parts, &c. Suitability for wet or dry years and any other notes.

Tractors and Fuel.—Keep a record of cost, repairs, and replacements, cost of fuel and area of ground covered. Work out cost per acre of each class of work. This record is essential to enable you to estimate your anticipated and probable expenditure. Records of actual work and cost are valuable for comparative purposes, but keep them in the book. Do not work it out in your head or on a scrap of paper. A carefully kept record over a period of years may alter your ideas on the advisability of tractor farming, either for or against it.

Motor Car and Truck.—Keep a record or the mileage and costs for fuel, oil, tyres, and repairs, &c., of your truck and car. This will enable you to control your expenditure on these items, which can easily account for a great deal of money if not closely watched. If the car is proving too expensive for the amount of money you have available to run it, then run it less. If the truck is too expensive use the horses more.

Sheep, &c.—Keep a record of dates and prices of flocks purchased, number of natural increase, weights and average of clips, prices realised for wool and lambs, and annual profit derived from the sheep. From this record you will gain information of value in the purchasing of further lines, and will be able generally to know exactly where you stand in this probably most important adjunct of farming in these areas.

Cattle, Pigs, and Poultry.—Keep records of number of each class of stock on hand at the beginning of the year, records of purchases, natural increase, sales, &c., during the year. This record can be easily kept by ruling several columns, and will be valuable to you in selecting the most profitable side lines for your concentration.

Weather.—This record is important. Keep record of rainfall for each month and yearly total, and work out averages over a period of years. At side of page have a space to record any special features, such as length of dry spells, storms, &c. This record will be used in conjunction with several others, but mainly the grain record. Well-kept weather records often mean an appreciable premium to you when effecting a sale of your property.

Income.—Keep a complete record of your income from all sources throughout the year. Show the income from each section of your activities separately, with the prices realised per unit, as a comparison will not be effective unless this detail is clear. The principal items would be:—Proceeds of grain, &c., fodder, stock sold, sheep and wool, dairy produce, and sundries.

For convenience it will probably be necessary to keep a page aside for use during the year on which to note down the income as received. Treat butter and eggs, &c., given to storekeeper in exchange for stores as income. At the end of year put the totals of each item on to the ruled record page for comparison with other years. This record is for yourself only, and not for the before-mentioned Income Tax Commissioner or your banker, so be careful to keep it very accurate. It is very important for you to know exactly what your gross income is, and from what sources you receive it. If one source shows an increase on previous years it is probably satisfactory, but if a decrease is shown, then you can look around for a cause, and if it is in your power you can take steps to prevent a recurrence.

Expenditure.—This probably, to my mind, is the most important of all sections of which accurate records must be kept. If expenditure is not controlled it always creeps ahead of income and the resultant period of depression quickly follows, and there is nothing in this world harder than working off deficits. There is no necessity to keep a complete set of double-entry books, but you should keep a record in columnar form of expenditure on different sections of your farm. This record can be compared with those of income, and you can adjust your affairs accordingly. The main columns you will require for this record will be as follows:—

Direct farming costs: Super, fuel, wages, sacks, twine, oil, repairs, &c., &c.

Other costs: Interest, &c., household and living expenses, motor car, pleasure and personal expenditure, subscriptions, &c.

Capital expenditure: Cost of machinery, &c., purchase of stock, &c.

The Budget.—This will be completed from the information supplied in the various sections of your book and is of great aid to you in determining exactly what you can do for the coming year and not what you would like to do.

To prepare your budget recourse will be made to the records on which I have already spoken, but the principal ones to deal with at first are those appertaining to income and expenditure. After completing your work you can finalise these two records and ascertain exactly how you have fared financially for the year, and will know what money you have in hand with which to carry on for the next year. Having arrived at a starting point, we continue with the budget and decide our farming operations for the year. That is, areas of crop to be sown, classes of crop, varieties of seed, fallow, stubble, grassland, &c., &c., and also proposed holding of stock and sheep and any other lines on which you anticipate concentrating during the year. You will use the records kept to help you in this, and will be guided by past experience and results, and thus arrive at the best thing to do.

Now, having determined what money you have and what you want to do, set the two down and work out what it will cost you to carry out your programme. Do not guess. Write out every conceivable possible expenditure that can crop up and make liberal allowances if possible for contingencies. Apart from the actual cost of material and labor to work out your programme, you must provide for your living and that

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White Indian Runner Drakes and Ducks.
White Leghorn Roosters.
Black Orpington Roosters.

— **FULL PARTICULARS FROM THE PRINCIPAL.** —

of your men, and all such items as replacement of plant, possible repairs, purchase of stock, horses, sheep, &c., &c. You must provide for your personal expenses, running the car, entertainment, taxes, rents, interest, and a host of items, but make sure all possible expenditure is included for the coming year. Now you know what cash you have to start with, and can proceed to estimate what income will be received by you during the year from all sources, but principally from sale of produce, stock, hay, sheep, &c. Try and make the estimate as near as you can, but always err on the conservative side. It is safe play to be pessimistic about income, and rather the reverse about expenditure.

If on comparing your estimated expenditure with your cash in hand and estimated revenue, you find that the latter is the smaller, then you must start off and modify your plans and make cuts here and there, until you can see the two sides balance. Of course, you can sometimes make the two balance by borrowing money to supplement your income, but always hesitate to borrow, think twice and even more, because it costs money to borrow money and it must be paid back. Try not to borrow, except for capital improvements which are calculated to return money to you or save you expenditure, or increase the income-producing capacity of your farm. Having managed to balance the two sides of your budget, and arrived at your programme, you are in a position to know exactly where you stand and what you can safely do; but, remember, that having gone to the trouble of working all this out, you must keep to your budget, otherwise trouble will come, and something extra has to be done to overcome it.

If a contingency arises necessitating a departure from one item of your proposed expenditure, then compensate for it by cutting down some other item or adding a balancing amount to the revenue side of your budget.

STARTING ON A VIRGIN SCRUB BLOCK.

[By G. W. Cant, Kelly.]

(*Kimba Conference, October 3rd,* 1932.)

Unfortunately for this State, which depends more on primary production than any other State in the Commonwealth, we have had in the past too many persons who have taken up land for the purpose of speculation. These so-called farmers who, apart from putting up temporary improvements, work the land with the idea of getting the most out of it and then selling it at a profit in boom periods, leaving the unfortunate purchaser to find out that not only are the improvements temporary, but he has bought a wheat sick farm. What is needed is the type of settler who is going to design, improve, and work his farm with the idea of making it a home for himself and his family for generations. This man will use his brains in connection with the clearing, fencing, subdividing, and working of the farm, and each phase of his labor will make it a more valuable property. The selection of a site for the homestead should be the first move. This should be built in a position that will allow the quickest and simplest working of the holding. The lay of the land and fertility of the soil should be well considered before this is done, always remembering that the home and buildings should be in a position that will allow of good drainage and sanitary precautions.

A house in a low, damp locality, or in too close proximity to stables, pigsties, and such like is not a suitable place to rear a family and live for a lifetime.

The clearing of the land is a very debatable question. My experience is the heavier the timber the less the risk in clearing large quantities, as lighter timbered country has more roots, hence the risk is greater (in the event of light crop, which means poor stubble burns) of the land growing back to timber.

Crops grown on new land in the heavy timbered parts of this district depend wholly and solely on the amount of rain that falls during the growing period. In a wet season 20bush. or even 30bush. on land simply ploughed and drilled are quite possible; in a dry season a total failure is almost assured, whereas further south, where the timber and soil are lighter, it is better to clear the land in smaller quantities and fallow all that is to be cropped.

Crops on land of this nature and sown on fallow last season yielded 6 bags per acre, whereas new land adjoining sown without fallow yielded 6bush. Heavily timbered country, while perhaps being a little more expensive to clear in the first instance, can be worked with less plant and labor during the initial stages than the lighter country, so the amount of land to be cleared yearly depends solely on the class of timber, soil, and capital available. Don't clear more than can be handled. Too many farms have been spoilt with trying to clear too much.

Timber is of incalcuable value for shelter and shade for stock, and in the clearing of the farm in the first place farmers would be well advised to think before they cut down certain patches or leave others to be a permanent nuisance. A good reserve of timber around the homestead is most essential.

One of the most important and necessary things to have on a farm is a convenient and ample supply of water, and the farmer who is able to erect the means of raising and conveying it in sufficient quantities to places where it will be needed for stock, house, and garden is a fortunate man, and has added greatly to the value of his home.

Machinery should be chosen carefully, consideration being given to the best type for the job, and the type that will have a fair life. The farmer that spends much time at sales looking for a cheap implement generally finds himself with something that has seen its best days, and has to spend money on repairs right from the start.

Farmers who can manage to start with new implements of a good type are the best off in the long run. They must realise, however, that these implements must be well housed when not in use, and that time given in a good overhaul and clean up after use is well employed. A £200 harvester is an expensive fowl roost.

If horses are to be used as a means of power in working the farm, the farmer should realise that he will save money by buying good class animals in the first place. If this is done, and he breeds systematically, he will eventually own a well balanced team.

Remember that a useless horse eats just as much as a good one, and struggling along with an indifferent team is worth considerably more than the difference between a team of horses and a team of scrags. Lack of power means bad farming, and often a bad temper. Again, the farmer who spends money in securing good horses and does not follow it up with providing good stabling and feeding, is actually wasting some of the money he has already invested. Assets in the shape of livestock deteriorate rapidly if not looked after thoroughly.

Most farmers keep a cow or two, some go in for it more extensively as a side line, but I don't think there is any branch of farming that has been more abused in the past than this. In order to get the best out of this department of farming and value for the time and money expended, it is necessary to secure good cows of a breed suitable for the district and feed available. Here, again, you must help the cow to give milk and butter by providing suitable foodstuffs for its production. No sensible farmer will run his car without oil, but dairy herds are often expected to run without the suitable foodstuffs to make them function properly. A good dairy herd can be soon built up from a good foundation, but it takes many years to produce payable types from mongrels.

Before starting a sheep flock it will be well to decide on the type that will pay best on the average in the district. If you have a heavy growth of feed on your land and need your sheep to run constantly on the fallow to keep the weeds down, it is not feasible that you should expect to produce a high quality, clean Merino fleece that will bring top price in the wool market and it may be advisable to go in for a flock that will produce a good type of lamb for early sale or export. In starting this most important side line on the farm, after deciding your particular breed, procure the nucleus of your flock from some reliable breeder.

Poultry, in common with cows and horses, must be housed and fed properly, have ample run, and kept free from vermin. Taking into consideration the initial outlay and the small amount of work involved, the poultry run, to my mind, is the best paying side line on the average farm.

In order to work the farm economically it is well to remember that repairs will be needed to plant and machinery, and that if you have a convenient workshop and suitable tools you can do a lot of these repairs yourself, and so save quite a lot of time and money. This is a department that calls for careful thought and judicious purchasing. Do not spend money on expensive tools that you are not capable of handling.

No farmer can do all that he would like in laying out the various departments of his farm, but he should do his utmost to avoid makeshifts. It is better to do without some article for a time than to buy a poor substitute that will have to be scrapped before it returns its value.

Do not change your ideas and principles because there is a temporary fall in the price of any commodity, but remember that it is the income on the average that matters, and not the top price you get in any one year.

Finally, having set your farm out and established the various departments to the best of your ability, remember that it will be of little use if you try and farm more than your plant will allow to work properly.

WHY FALLOW AND ROTATION CROPPING?

[By Mr. J. F. Heylen, Pygery.]

(*Central Eyre's Peninsula (Wudinna), October 5th,* 1932.)

In districts with limited or low average annual rainfall and severe spring weather it is essential to conserve moisture to withstand these climatic conditions, and this is best and most economically done by early winter fallowing and subsequent workings of the soil to check evaporation during spring and summer. When land is fallowed in this way, the added soil moisture assists bacterial action to such an extent that approximately 60lbs. of nitrogen per acre will be stored in the soil for the next crop, and practically all of this nitrogen will be taken from the atmosphere. Therefore, this is certainly the most economical way of purchasing nitrates for our soils.

The third factor in favor of this method of cereal growing upon fallow is the assistance that the cleaning of the land of weeds and the added fertility gives to the suppression of takeall, which in the last few years has developed rapidly. Bare fallow taken in conjunction with systematic growing of oat crops and the burning of grass or stubbles upon the soil will effectively and definitely check takeall.

Allied to these three factors is the growing of oat crops after wheat grown upon the fallow. A very profitable crop of oats can be grown in this way, provided an early oat be sown. Therefore, if the previous fallow has been kept free from weeds, a very light working will produce a heavy crop of oats and two profitable crops to the one ploughing.

Now we come to a bone of contention among farmers, many of whom believe that fallowing entails more work annually than autumn working of the soil. This idea is quite erroneous, as by ploughing or fallowing in winter the soil is in better condition for this heavy initial working in the great majorty of cases. Also, the farmer is not so pressed for time, and can wait for rain, and therefore can do the heavy work when conditions are most favorable. Again, during early spring all stumps can be picked from the land, and the following autumn the crop can be sown upon this prepared land much more economically than upon autumn land that has to be broken up. However, concluding this, let me also point out the added advantage gained in being in the position with fallow prepared, to sow at the time the grower feels is the most suited for a good germination of his crop.

The most important reason why fallow and rotation cropping are desirable must be looked at from a business and financial aspect. The system is the road to a greater average yield, both in wheat and oats; also a greater carrying capacity of livestock upon the farm, extra income and less expenditure.

PRACTICAL BREEDING OF DRAUGHT HORSES.

[By Mr. A. J. SHEPHERDSON, Wudinna.]

(*Central Eyre's Peninsula (Wudinna), October 5th.*)

There is scarcely a farmer to-day who is not in need of a certain number of draught horses. A few years ago a young draught could be purchased at from £15 to £25, according to size and quality. At the present time horses of the same age are selling at £30 and up to £40, and the farmer who continued breeding throughout the slump period is now reaping the reward he richly deserves. A few years ago there was a definite swing away from horses to tractors and motor trucks. Farmers to-day are alive to the fact that horses, after all, are indispensable, and certainly much more economical in the working of the farm than are tractors; hence, the demand throughout the State that caused the present high prices.

Farmers are now naturally turning their thoughts to the breeding of the horses which they realise they will need in the future. The slump in this industry has caused a great loss to Australia, but was not due entirely to the advent of the tractor, but also to the lean seasons through which the State has passed during late years, which have had a marked influence in retarding the growth of this industry. With only a very limited supply of horse feed on hand (in some instances bought through drought relief) only the bare number necessary for the efficient working of the farm was deemed sufficient stock to feed. To-day there is ample feed held in reserve on most farms, but with the wetter seasons it is found necessary to have a stronger plant to contend with the bulkier growth of weeds and heavier workings caused by such seasons.

The best and cheapest method of replacing aged and worn horses is by breeding young stock, always providing you are a successful breeder. To stint eight or nine mares to a travelling stallion and get only one foal does not give you that qualification. This may be partly the fault of the horse and to a certain degree due to mismanagement. If you are an unsuccessful breeder, try to ascertain just what is the reason for it; you cannot afford to pay service fees and waste much time by not getting results. It is possible that the mares are not in a suitable condition for breeding. If they are working hard and long hours daily, and are possibly low in condition, it is much better not to bother with them until late spring. Then turn them out where there is good, green picking, and when they have improved their condition, you will find them much easier to get in foal.

When mares have been served, they should not be put to work immediately afterwards, nor should they be left in the yard amongst the other horses, but should be put in a vacant stall or a small paddock where there is no danger of them being molested. Never use a stallion which you have reason to believe is being drugged. You cannot expect to get a satisfactory percentage from such an animal, and it is feasible to believe that stock so obtained cannot have the vigorous, healthy constitution of those obtained under natural conditions. If you are prepared to put up with the bother of his attention and have sufficient mares to warrant keeping a stallion of your own, you will get far more satisfactory results by doing so. He should be put to work on the farm and broken to work in the dray, particularly in mallee districts, where a good dray horse is so essential for stump picking and many odd jobs. By working the stallion you keep him healthy, he is not likely to get foundered from over-feeding or break out in sores on his legs, and most important, he will be found to be much more reliable as a healthy foalgetting sire.

When the stallion is being used for stud purposes, he should always be taken out with a bridle, never with winkers. Apart from the danger of his getting kicked with winkers on, he will quickly realise the difference between the two and act accordingly. If he is never used for stud purposes, winkers make him a much safer animal when working in the team.

It is never advisable to lose sight of the fact that quality counts for much in horse breeding. Do not, for the sake of a few pounds, be tempted to buy an animal of inferior class. Always remember this animal is one of the foundation stones on which you wish to build your future team. Use common sense when purchasing mares for stud purposes, always remembering that like begets like; consequently, you cannot expect to breed a shapely filly from a flat-ribbed, bull-necked half bred draught mare you may have in your stable.

THE CLYDESDALE.

The ideal for which we should endeavor to breed or in the first instance to buy, is—firstly, a mare possessed of an even temperament, docile, and tractable; secondly, to be well ribbed up on a roomy barrel, and possessing nice flat bones, and fine silky hair. Hair denotes quality, and while coarse matted hair on the legs may be an indication of strength, it also shows a decided lack of breeding of the type which is accepted as the best for farm work in Australia, and that is the Clydesdale, and to which my remarks refer.

The Clydesdales of to-day are of a type quite different from those bred several years ago, and in my opinion the change is for the worse. The present type is much lighter in the bone than his predecessor, stands back on his fetlocks and pasterns to a marked degree, which we are told allows him to travel on hard roads with less likelihood of injury to his legs. While I admit that a certain amount of freedom may be advantageous, it has been developed to such a degree in this modern animal as to apparently constitute a weakness.

Care of the Mare and Foal.—It is not a good practice to work a mare which is rearing a foal; it is not fair to the foal nor the mother, and in most cases is injurious to both. Give the foals every opportunity from infancy to make growth and development will rapidly follow if the mother receives ample feed and is kept in good condition. When weaning the foals, it is not a wise policy to feed entirely on hay chaff. At least two feeds per day of long hay is advisable. This keeps the foal from bolting its food, and also keeps its young teeth in order. Water should be accessible to the foal at all times. Should there be greenfeed in the paddocks sufficiently strong in nutriment, the foal will do equally as well turned out with the loose horses as confined in a loose box, and be more contented.

Some people condemn the practice of handling the foal when running with its mother, their reasons being that it makes the foal mischievous, and when broken to harness is very often a slow and indifferent worker. I have always handled my foals at this age, and so quietened them that I could go up to them anywhere in the yard. I find it a great advantage should they require medical attention or treatment in any way. I have never found them turn out sluggish workers, and some of my most active horses in the past have been developed from foals possessing the quietest dispositions.

Much care should be given to the mares after they have proved to be in foal. In careful hands it is quite safe to work the mare to within a fortnight of foaling. It keeps the mare from becoming too fat, her muscles do not get flabby, and she is in much better condition for foaling than if she had been running idle in the paddock. A careful watch should be kept on the mare about the time she is due to foal; some mares foal easily, whilst others require assistance at this time.

As soon as it has been ascertained that everything is in order and the foal has had a drink, the mare should be left alone and kept as quiet as possible. The mare should not be allowed to mix with the other horses until they have become accustomed to seeing the foal and the foal itself has become strong on its legs as well. Very few horses will kick a young foal, but there are exceptions, and these must be guarded against.

Do not attempt to wean the foals in a barb-wire enclosure. Many young horses have received ugly disfigurements, and in some cases permanent injuries by this abominable practice.

PIGS ON THE FARM.

[By Mr. C. W. JOHNS, Wudinna.]

(Central Eyre's Peninsula (Wudinna), October 5th.)

A very considerable amount of thought has lately been devoted by farmers to the question of adopting sidelines as an additional means of raising revenue. A great deal of space has also been devoted to the subject in the press, some of which articles being over optimistic and unpractical, showing a decided lack of practical experience in farming. Bearing this in mind when setting out to write this paper, I headed it with a question, "Can farmers on Eyre's Peninsula and the West Coast make pigs a profitable sideline?" I must confess that my experience of pig keeping is somewhat limited, but I have had a little experience, and for some considerable time have been keenly interested in the subject and have taken particular notice of that which has been written on the subject by those who claim much experience. It is my hope, therefore, that it will interest members and stimulate inquiry so that we shall eventually be able to develop pigkeeping as a profitable sideline.

The Possibilities of the Export Trade.—At the present time many are holding quite a fair number of pigs of various sorts and wondering how to dispose of them at profit. If we take into consideration the factors of our isolation from the mainland, our lack of population, coupled to the fact that Adelaide and probably the Eastern States are already well supplied, we shall be forced to the conclusion that our only hope is the export trade. I strongly believe that if we can get a reasonable price for our pigs (I use the word reasonable as I am not prepared to say what that price should be) we shall have few other troubles to contend with. We have a healthy climate, plenty of space, and an abundance of cheap feeding material, and I think that it will be profitable to feed them with wheat, at any rate while it is under 3s. a bushel.

We are told that those who contemplate competing in the export market must study the importers' requirements and fulfil them. Great Britain imports large quantities of pig products annually from foreign countries, and only a small percentage from Australia, and I believe that in spite of the geographical position of this country—which is a natural disadvantage—we shall in a few years' time supply a much larger quantity to Britain, because we have the decided advantage of being able to produce cheaply to offset the high costs of transportation. To share this trade we have to send the right type of pig, fattened or grown to a decided standard, and keep up a regular supply at a cost to us commensurate with the price returned.

The Type of Pig Required.—Up to the present, returns from cargoes exported have been disappointing, but in fairness we must allow that our shipments to date have not been of all one type and weight and prime. At the present time we are using a variety of breeds, and it would be necessary to scrap most of these and go in for the sort the British bacon curer requires.

At a recent conference in England between representatives of the National Farmers' Union and bacon curers, the conclusion arrived at was that the Large White crossed to the Mid York was the most suitable. This cross also, I notice, came out on top at some recent trials at Roseworthy College, but it appears to me that the dam might equally well be a Berkshire or Tamworth-Berkshire.

Breeding.—In selecting the boar and sow, the boar should have a deep, broad chest, the shoulders narrow on top and the back long and narrow, and one should note how many defunct teats it possesses; it should not have an odd number. These characteristics are passed on to the offspring. The sow should be similar in build to the boar, but a little more roomy in the back, and should not have less than 12 teats. Both parents should be active, *i.e.*, they should be of the type prone to put on fat instead of muscle. Neither should be used until at least eight months of age, or they will not have completed development, and will produce defective litters. Sows, except gilts, seldom miss 112 days, and when the milk is noticed appearing in the teats they should be under observation, as it usually means another 12 hours to birth. At this stage it is advisable to give the sow—as a precautionary measure—a dose of sulphur, 2 tablespoonsful. To induce her to take this, make it palatable by mixing with dripping and milk. As they seldom take food the day of birth, or the day after, dosing would be difficult then, but sulphur has a delayed action, and further medicine should not be necessary.

When a sow goes over her time some of the litter will often possess long black teeth, these must be extracted, or they will damage the sow's teats, resulting in the youngster getting no milk. Always remove the afterbirth, for if the sow eats it it will often bring on the habit of pig eating. This objectionable habit can often be cured by giving the sow salted pork thrown to her in small lumps and until she will eat no more. Many otherwise valuable pigs have often been slaughtered on account of this trait. It appears to me to be a mineral deficiency disease and somewhat akin to the cow and bone chewing habit, the salt acting as a corrective.

Generally speaking, pigs are fairly free from disease, especially if kept clean and given plenty of charcoal and a mineral mixture in the form of a salt and super lick. Litters intended to be marketed as baconers should be kept on the teat until 8 weeks old, or they will not make quick growth.

Feeding.—The modern method of the open yard or small paddock with greenfeed and small wind and rain shelter is the best housing, and will be ultimately adopted by all. The most economical ration will naturally depend upon the price or cost of the ration. At present wheat is the cheapest when the units food contained in it are considered, but, of course, we must keep it in our minds that a diet of wheat and water will not produce pigs suitable to compete with the Danish product now on the English market. If we can add to our wheat skim milk (or, as a substitute, meat meal) and green feed such as lucerne, our pigs should thrive.

To make a quick return of bacon and a 150lb. pig with a maximum of 2½in. of back fat, which seems to be the desirable size, it will be necessary to study feeding, especially as this also affects flavor of the meat. It should be ready to market at 20 to 25 weeks from birth. To keep down excess fat, a pig must be kept moving. This is where the paddock system of feeding is useful.

Pig Clubs.—It does not seem possible to make pig raising a sideline unless we are prepared to go "the whole hog," both in management and selling. It is often said that our Bureau papers do not carry suggestions for bettering conditions. I therefore offer here as a practical suggestion, that each Agricultural Bureau form a pig club. Such a club is very necessary and would help us considerably in organising the business. Such a club could have as its objective the collection and sifting out of all matters pertaining to pigs; it could inquire into such vital matters as freight and shipping. The cost of producing could be worked out, and probable returns estimated. Its members could co-operatively purchase stock, and by systematic breeding to time table could produce a joint truckload or shipload at any desired time, and probably if a chain of clubs were established, and worked with enthusiasm, we should find it also profitable to ship our lambs under the same organisation.

Mr. A. Kidman (Chairman of the Mount Compass Branch), who was visiting Wudinna, stated that the Bureau Branches should be the pig clubs mentioned by Mr. Johns, as usually only a few members joined clubs. One of the main considerations in keeping pigs was to see that conditions were warm in the winter and cool in the summer, with plenty of water.

Mr. A. J. Shepherd referred to the necessity for a market, and thought that the difficulty would be overcome by the factory at Port Lincoln, which he hoped people would support.

Mr. Barlow (Chief Dairy Instructor) pointed out that the type of pig required to-day was quite different to that of four or five years ago. Farmers should obtain the right type, as the time was long past when any type of pig brought top prices.

If farmers bred the export type of pig any surplus over local requirements could be exported. England required a white pig, as it was more appetising than other types. Consumers did not want fat bacon, and he thought that higher prices would be obtained where there was no more than 1in. to 1½in. of back fat. He advocated rearing pigs in open small paddocks (two to three acres). Many farmers have run pigs in the open on green feed with plenty of water and found it was most economical—particularly where self-feeders were provided. Small paddocks should be spelled occasionally to lessen the chance of disease. He advised his hearers to procure copies of the Department of Agriculture Bulletin on Pig Feeding Experiments at Roseworthy College.

PREPARATION OF THE MERINO WOOL CLIP.

[By MR. W. E. BRYANT, Cummins.]
(*Cummins Conference, October 7th,* 1932.)

In the preparation of the wool clip two things are very necessary—a rolling table for wool rolling and piece picking, and a broom for keeping the shearing board and floor clean. For the wool table I recommend one 10ft. to 11ft. long and 4ft. 6in. wide and 30in. to 33in. high.

For a farm clip of 500 to 800 sheep, including lambs, I suggest two main lines of fleece wool—AA to consist of all the longest stapled, lightest conditioned, and brightest fine wool. A would be similar in quality, but mostly shorter in length and heavier in condition and generally less attractive in appearance. Any very short stapled and heavily conditioned wool should be kept separate; this also applies to very strong or coarse wool and tender or broken stapled wool. If there is enough wool from these lines to make one bale of each sort, I would brand the short stapled, heavily conditioned wool C, the strong wool B, and the tender or broken stapled wool "Fleece."

Starting from the shoulders, the fleeces should be cleanly and evenly skirted. If free from burr, very little need be taken off, except the sweaty edges and stained wool. Should the lower edges of the fleece be burry, and the balance free from burr, the burry wool should be taken off; but I do not advise heavy skirting if the whole fleece is burry. If the back wool has perished and is dirty in appearance, it should be taken out and branded "backs." This should be done on most farms, as the sheep are generally used on the cultivated land, and get very sandy on the rump and back.

When rolling the fleeces, they should be turned over twice from one side and rolled from the breech; this leaves the best part of the fleece—the shoulder wool—exposed. For the average farm clip one line of pieces is sufficient. Should two lines of pieces be made it is advisable to brand them "A pieces" and "pieces"; on no account brand them "firsts" and "seconds." This rule applies to all lines of wool, including

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lamb's wool, as many buyers are instructed not to buy seconds in any line, although a line of seconds from one clip may be quite equal to a line of firsts from another clip. If branded seconds, the buyer often has to pass them. All belly wool should be kept separate and branded ''bellies.''

All stained wool from breech and bellies should be kept separate and dried; urine stained wool will not scour white.

If there is enough lamb's wool to make two lines I would advise making two lines. ''A lambs'' to consist of all the longest stapled, lightest conditioned, and brightest free wool; ''lambs'' would be the short, heavy, and burry lamb's wool.

If one has 450lbs. or more of lamb's wool it is better to try and make two bales of about even weight instead of one very heavy bale and one light bale. This applies practically to the whole of the clip.

The minimum weight of a bale of wool is, Merino 250lbs., crossbred 225lbs., lamb's 200lbs. Anything under the above weight is termed a lightweight bale, and sold separately. Lines of three bales or less are known as star lots, but the wool brokers interlot these lines, if possible. Now that this is done, the old fear about star lots has practically disappeared. All bagged wool is reclassed and sold in lines, although the grower has to pay ½d. per lb. for the reclassing, he usually gets a better price per pound for the bagged wool owing to more competition for it in much larger lines.

Crutching.—As part of the preparation of the clip I strongly advise crutching all sheep during autumn, as the wool from autumn crutching is fairly clean and of some value, but when left until plenty of green feed is about sheep get very daggy and a great deal more wool is stained, which means a reduced price per pound and sometimes a complete loss. If the sheep are not crutched they generally have to be dagged before shearing.

Branding.—As stencil plates are very easily cut out of ordinary flat galvanised iron I advise cutting the following plates:—Owner's initials or name, name of farm, pieces, bellies, locks, lambs, and letters A, B, C, numbers 1 to 9 and 0. The No. 6 will also do for 9. Brand all bales on top and front of bale, owner's initials or name first, name of farm next, class of wool, such as AA or A, and number of bale last. Brand all bales in consecutive numbers, from 1 upwards. On no account have duplicate numbers.

As jute fibre will not take the same dye as wool try and keep all ends of twine and jute fibre out of the wool. For shear cuts during shearing or dressing fly-blown sheep avoid tar or any preparation containing tar. Try and keep all lines of wool as even as possible and avoid false packing. If in doubt as to which line in which wool should be placed, always put it in the lower line. It is better to lose a little on a few fleeces than on the whole line.

Carelessness does not pay in any industry, and the wool industry is no exception to that rule.

GREEN FODDERS.

[By F. J. Jericho, Cummins.]

(*Cummins Conference, October 7th,* 1932.)

From personal experience I have found that green fodder is one of the most important feeds for stock on the farm.

The principal fodder I adopted for winter was Burr Clover, having a small paddock with clover which was kept free from stock until all was dry, putting the sheep into the paddock for a day and then into the paddock in which it was desired to establish the clover, and keep them there for a few days, repeating this practice until enough seed was spread by the sheep's droppings.

Another method is to gather the clover straw with a horserake and then use a strong broom to sweep the burrs together. When sowing the seed by the drill, put the sweepings over the winnower. It is best to sow the seed when sowing oats, either in the super or in the oats. It will germinate better on the ground than when sown too deeply. Clover will make good growth on new land which has carried one crop. I have five acres of new land cropped with wheat, which was too poor to reap at harvest time. The following year I put barley on it with 90lbs. of super, and reaped 12bush. to the acre. As the seed was spread there the previous year the sheep had the feed and straw, and nothing was left to burn but the bushes, and the bushes had to be cut every year.

Last harvest all the clover straw was gathered—approximately more than 1 ton to the acre—and at present the feed is 25 per cent. better than the last. I have not seen any in the district equal to it. The 200-acre paddock, of which the biggest portion is a mat, would average a bigger percentage than that previously mentioned. For summer fodder I have tried Johnson and Sudan grasses. Both are good, but do not germinate too well. Early frosts will cut the Sudan grass.

Wimmera Rye grass is good for late winter feed; stock readily eat the dry straw, which is softer than water grass or any kind of straw. I would class Wimmera Rye as a weed on fallow should early rains fall. Nothing will beat dandelion for an early weed. The best of all fodders is lucerne; it is somewhat difficult to start because the seed must be sown on fine soil and at very shallow depth. It is pleasing to see a green paddock of lucerne in summer when all other feed has dried off. It grows quickest on limestone rubble. A dressing of super every year will improve its growth wonderfully.

DOES IT PAY TO RAISE LAMBS FOR THE FREEZERS?

[By Mr. W. P. Cooper, Koppio.]

(*Cummins Conference, October 7th,* 1932.)

From the little experience I have had I think it pays to raise lambs for the freezers. Of course, one must use the English breed of rams to get anything like good results. I do not think it is of much use trying to raise Merino lambs for this purpose as they do not fatten as well as the cross-bred lambs, nor do the carcasses look anything like as attractive as the cross-breds. They are also much more likely to be affected with grass seeds, which must be avoided. Buyers strongly object to lambs affected in this way. The Merinos are also much more likely to be struck by flies which cause no end of trouble. To raise lambs for freezing use big framed, full grown, Merino ewes joined with English bred rams. By using the Merino ewe one has the advantage of the good fleece of wool, and can also raise a fairly good type of lamb.

There are, of course, many different breeds to select from, and it remains to be seen which breed will suit this particular district. The Southdown ram seems to be well favored in many places. I have selected Dorset Horn rams and joined them with Merino ewes and the results have been very satisfactory, the lambs produced maturing very quickly and presenting a very pleasing appearance; and they also seem to be very easily contented. Out of 66 of these lambs taken to the freezers last season I had 60 first grade, five second grade, and one reject through deformity. With 21 Merinos, which were the pick of over 200, the result was six first grade, eight second grade, six third grade, and one reject. From this it can be readily seen that one must have cross-bred lambs to get good results. Further, the difference in the price of each truckload was:—Cross-bred, 21 lambs, realised £10 12s.; Merino, 21 lambs, realised £7 15s. 11d.

FALLOWING.

[By T. D. VOGT, Yeelanna.]

(*Cummins Conference, October 7th,* 1932.)

To derive the best results from cereals, the crops should be grown on bare fallow. Fallowing means ploughing the land at suitable intervals during the year previous to sowing the crop and allowing it to rest in the interval. Bare fallow enables the farmer to conserve extra moisture for the coming crop, and also the cultivations necessary to do this afford favourable conditions for the work of nitrification. The process of nitrification proceeds rapidly during fallowing, and so nitrogen is made available. Fallowing stores rain which falls during the months before the crop is sown. The rain penetrates the subsoil in the winter, and by capillary attraction ascends to the surface and escapes in warmer months—the firmer the surface soil the greater the rate of evaporation—therefore, fallowing delays this.

The land should be worked from time to time until free from weeds, and the soil consolidated to within 2in. to 2½in. The surface soil should be loose—this checks evaporation. It breaks the continuation of escape of moisture from the soil below. The earlier the soil is mulched the greater the percentage of rain is caught. During the warm months the soil bacteria are most active, and a crusted surface is not satisfactory for their work.

The loss of moisture through a tight compact surface is enormous. The action of water is similar to a lamp wick—the lower moisture rises to the surface and is lost by evaporation. It is not necessary that the surface mulch should consist of finely pulverised soil, in fact it is preferred to be rather rough with small clods, provided looseness is maintained. A crusted surface also does not permit of sufficient aeration and, should heavy rain fall, does not receive its maximum benefit.

Fallowing should be commenced as soon as possible after seeding. Early fallow receives the advantage of the winter rains. Fallowing early conserves the maximum amount of moisture and the rains assist in packing the lower soils, and preparing a solid seed bed. The earlier the fallow the more autumn and winter rains are caught. Once created, the fallows should be maintained; considerations which govern this are weed growth and maintenance of seed bed. Never let the soil dry out in the sod; harrow in late winter or early spring. Where possible, after summer rains, cultivate the fallows. Many fallows are worked well up to a point, and then let go. Retain the fallows in the best possible tilth. It is not wise to work any soil when it is too dry; it is just as bad to work heavy clays too wet. It should be done when the soil is crumbly. Do not do it when convenient to you, do it when it needs it.

The type of instrument to use is important. The best are harrows, scarifier, skim plough, and spring tined cultivator. The number of times the fallows should be worked is governed by the number of useful rains, and the amount of weeds developed. Set your moisture trap before it rains. Fallowing means an extra bag or two to the acre to you. Remember you are making moisture, making the right sort of seed bed, and enabling the bacteria in the soil to manufacture nitrates, thus enriching the soil.

The conservation of moisture increases the supply of available plant food. Bare fallow enables the farmer to have larger areas available for the drill, so that he can concentrate on sowing the crop at the correct time, and whenever favourable conditions occur. Fallowing has also the tendency to destroy the spores of disease, especially takeall. Fertilise, fallow and sow in the belief that the season will be a dry one; you cannot go wrong if you do that. In conclusion I advocate the following slogan:—Sow your wheat on fallow; fallow early.

RABBIT DESTRUCTION.

Paper submitted by Mr. M. A. Palm, Cummins, for the Conference of Lower Eyre's Peninsula Branches at Cummins on October 7th, 1932.

Owing to the alarming extent to which rabbits increase under conditions which are favorable to them, it is well to point out the importance of every landholder doing his utmost to keep the pest in check. There is no doubt that when left unchecked, rabbits cause a great deal of damage to crops and pastures, and cause heavy losses, both to the farmer and to the State each year, from the amount of crops which are eaten off. Many farmers go to endless trouble to reduce costs of production, and yet leave the rabbits go on unchecked. The purpose of this paper is to give an outline of the methods we have adopted with a good measure of success, and if every farmer would spend a few days two or three times each year, the rabbit nuisance could be kept well in hand, in the farming areas at least.

For quite a number of years we have used exhaust gas to fumigate the warrens, and I am quite convinced that this method is 100 per cent. efficient if carried out with care. The method we adopt is to fit a length of flexible hose about 15ft. long to the manifold of an old car engine, keeping all joints tight, and not allowing the gas to escape. The hose is put in a hole on the wind side of the burrows, and the hole is then closed up. The engine is set to run at a fair speed, and the mixture is then enriched as much as possible without causing trouble through fouling the plugs, either by unscrewing the jet, or withdrawing the choke, whenever the smoke appears the hole is closed up, and in the event of there being any holes from which the smoke does not appear, the pipe should be put in these because there are occasions when the holes are not all joined up, though this is very rare. The engine is then left running for five to ten minutes, thus ensuring a thorough circulation throughout the warren. The hose may then be removed and the job is complete. One man can manage the job quite easily where the burrows are small, but where they cover a big area it is much better to have two men on the job in order to fill in the holes as rapidly as the smoke appears. The method is very cheap considering the number of holes which can be treated in one day. It is a great advantage to fumigate the burrows soon after the paddock has been cultivated, because where there are bushes or other cover there will always be a few stray rabbits that are not in the burrows, and these are disturbed with the working. It is only these outside rabbits which will again open up the holes after fumigation. It it is not convenient to attend to the burrows soon after working the paddock, a good active dog will start up many rabbits which are squatting about, and drive them into the burrows. The method outlined is very effective in killing all rabbits in the holes, but unless the burrows are destroyed in some way the few outside rabbits will soon open up all the holes again, and even a few rabbits will very rapidly breed up.

A method found to be very effective is to plough in the burrows with a single-furrow plough; remove the mould-board and let the plough in as deep as it will go, and unless the burrows are close to scrub, it is rarely they will ever be dug out again. Rabbits like a good deal of cover, and they will not often dig new holes in an open paddock. In order to make the job really effective it is a good plan to go around again and fumigate any holes which may have been opened up after about three weeks or so. The eradication of rabbits is much more difficult where there is scrub adjoining, but it will usually be found that there are many burrows in the scrub which can be treated with very beneficial results. A good number of rabbits can be poisoned fairly readily when feed is scarce in the summer months by mixing about half an ounce of strychnine with a tin of raspberry jam, and smearing a small amount on stumps or the like, along pads, &c. Although large numbers of rabbits may be destroyed by trapping, poisoning, shooting, &c., I do not think anything is so effective and so easily carried out as fumigating with the exhaust gas and ploughing in the holes afterwards.

An individual farmer will have a very hard task endeavoring to keep the rabbits in check unless he also persuades his neighbor to do his share, because it is by co-operation that any real success can hope to be achieved.

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Sept.	Per Cow during Sept.	Per Cow October to Sept.	Per Herd during Sept.	Per Cow during Sept.	Per Cow October to Sept.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C....	33·17	30·17	26,320½	793·50	6,578·24	1,293·40	38·99	334·85	4·91
5/D ...	32	31	24,352½	761·46	6,470·85	1,281·65	40·07	343·14	5·28
5/E ...	41·90	35·80	27,340½	652·52	5,842·75	1,572·38	37·53	313·21	5·75
5/L ...	19	19	14,805	779·21	7,409·06	717·80	37·78	368·49	4·85
5/R ...	60·23	47·70	34,306	569·58	4,364·24	1,385·50	23·00	183·89	4·04
5/S ...	22	16·93	10,893	495·13	4,726·17	533·69	24·26	248·08	4·90
5/U ...	28	24·93	29,265½	1,045·20	9,504·76	1,303·59	46·56	411·09	4·45
5/Y ...	25·23	23·50	17,332	686·96	7,390·74	894·01	35·43	393·47	5·16
5/AA ..	16	15	7,725	482·81	4,644·45	402·88	25·18	250·04	5·22
5/DD .	20	18·83	12,437½	621·88	6,354·93	689·64	34·48	357·79	5·54
5/EE ..	18	18	18,840	1,046·65	7,763·81	987·64	54·87	409·68	5·24
5/II ...	28·70	22·77	18,223½	634·96	6,662·68	874·45	30·47	325·88	4·80
5/KK .	20	15·20	9,596	479·80	6,313·55	494·44	24·72	309·85	5·15
5/JJ ..	27·27	24·60	24,261	889·66	6,167·52	1,118·48	41·01	274·26	4·61
5/MM .	15	13	7,155	477·00	5,318·17	388·66	25·91	274·48	5·43
5/NN .	26·50	20·67	20,256½	764·39	6,344·07	974·61	36·78	308·97	4·81
5/OO ..	20·70	16·57	15,722½	759·54	5,760·00	755·43	36·49	270·07	4·80
5/PP ..	30·50	30	25,725	843·44	5,925·27	1,171·35	38·40	285·37	4·55
5/QQ ..	18	14·97	8,397	466·50	5,155·28	429·98	23·89	272·71	5·12
5/RR ..	22	21·50	12,810	582·27	Dec.-Sept. 4,371·05	729·34	33·15	Dec.-Sept. 243·09	5·69
5/SS ..	17·87	13	10,014	560·38	4,047·14	476·85	26·68	195·72	4·76
Means .	25·81	22·53	17,894·19	693·23	6,105·25	879·80	34·08	302·99	4·92

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Sept.	Per Cow during Sept.	Per Cow December to Sept.	Per Herd during Sept.	Per Cow during Sept.	Per Cow December to Sept.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ...	20	18·50	14,287	714·35	5,138·96	614·54	30·73	230·13	4·30
6/C....	21·33	19·50	19,539	547·21	5,884·69	775·28	36·35	260·37	3·97
6/F ...	25	24	23,535	941·40	6,734·69	1,109·77	44·39	329·02	4·72
6/H ...	30·93	30·67	27,346	884·12	5,466·52	1,225·71	39·63	253·93	4·48
6/O ...	17·50	16·50	13,515	772·28	5,213·22	708·04	40·46	273·10	5·24
6/X ...	19	18·13	11,879½	625·18	6,127·04	459·01	24·17	258·05	3·91
6/Y ...	21·83	14·67	8,020½	367·40	4,281·92	328·64	15·05	189·97	4·10
6/EE ..	41·47	24·93	14,974½	360·36	3,836·30	681·24	16·41	178·10	4·57
6/II ...	31·07	14·63	10,049½	323·44	5,274·87	445·26	14·33	242·42	4·43
6/KK .	19	15·63	10,539½	554·71	4,731·50	435·16	22·90	211·70	4·13
6/LL ..	23	15·03	11,615	505·00	5,203·53	470·37	20·45	214·53	4·05
6/OO ..	18·07	12·13	12,437½	688·29	6,729·76	526·83	29·15	306·87	4·24
6/PP ..	16·67	14·67	10,765	645·77	6,123·22	520·48	31·22	298·27	4·83
6/QQ ..	27·23	22·63	20,757	762·28	6,510·35	826·93	30·37	290·06	3·98
6/RR ..	30·83	26·13	23,786	771·52	6,453·06	926·13	30·04	278·24	3·89
6/TT ..	21·73	18·97	14,969	688·86	6,010·70	640·60	29·48	277·34	4·28
6/UU .	29	22·47	19,826½	683·67	5,255·15	769·03	26·52	227·69	3·88
6/VV ..	26·40	21·37	21,760	824·24	7,148·42	945·23	35·80	329·36	4·34
6/XX .	26·67	22·70	20,105	753·84	6,025·97	883·33	33·12	266·57	4·39
6/YY .	28·20	25·57	17,044½	604·41	5,376·31	813·85	28·86	273·41	4·77
6/Z ..	22·40	21	18,516	826·61	7,016·05	847·86	37·85	325·55	4·58
6/AAA .	21	18·90	15,984½	762·44	3,891·76	785·14	37·46	203·03	4·90
6/A ...	19·63	19·23	15,664½	797·98	Aug.-Sept. 1,481·70	701·57	35·74	Aug.-Sept. 68·13	4·48
Means .	24·26	19·91	16,387·65	675·52	5,598·55	714·78	29·46	256·39	4·36

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

DAIRY CONFERENCE AT MOUNT BARKER.

The following resolutions were carried at the Dairy Conference held at Mount Barker in May last:—(1.) "That this Conference of Dairymen meeting at Mount Barker on May 12th, 1932, demand that the Government amend the Dairy Act of 1929:—1. By appointing an Advisory Dairy Council to govern and regulate the whole of the dairying industries in South Australia. 2. That 50 per cent. of the Board consist of members elected by a majority of the cream suppliers with an independent chairman, and that power be given to the Advisory Council to fix all payments for butterfat."

(2.) "That this Conference recommends that the regulation under the Dairy Act, dealing with the grading of cream, enforce the fact that factories be compelled to notify suppliers as to the grade of their cream and stipulate that the respective grades are paid for at preferential rates".

(3.) "That this Conference co-operate to inaugurate a movement to reduce the manufacturing charges of butter".

The above resolutions were referred by the Advisory Board of Agriculture to the Australian Dairy Produce Interstate Committee, and the appended reply, dated July 26th was received from the Committee's Secretary (Mr. C. Harding Browne):—

"Your letter of July 4th, setting out the text of various resolutions adopted at a Conference of Branches of the Agricultural Bureau held at Mount Barker in May, has been considered by my Committee, and I have been desired to reply thereto as follows:— Whilst recognising the close inter-dependence of the manufacturer and the producer in the butter industry my Committee cannot admit the right of the supplier to any form of control in the industrial and commercial matters of manufacture, marketing, and price-fixing. The manufacturer of butter, like the manufacturer in any other industry, buys his raw material and from the moment the property in the material passes to him he has to bear all risks. He immediately becomes liable to the supplier for payment for the butterfat, and thenceforth he has to carry multitudinous risks, such as deterioration, movement of the market, bad debts, &c. It is admitted that a peculiarity exists in this industry in that the seller places himself in the hands of the manufacturer for the correct measurement of the quantity and quality of the raw material delivered. The very circumstances of the trade make this inevitable, and realising this the Government has set up adequate machinery for seeing that this trust imposed by the supplier in the manufacturer is not abused. This machinery includes the filing of monthly returns by all manufacturers, full powers to audit records to ascertain that such returns are true, and the widest possible powers of general inspection, in addition to which all suppliers have the right to call upon the Chief Dairy Instructor to make particular and detailed checks. With this unusual feature adequately covered so as to protect the supplier the position of the butter manufacturer is, we repeat, in no way different from that of any other manufacturer. From this emerges the fact that the term 'manufacturing charges' is a misnomer. A charge cannot exist without there being some second party to the charge, and as the raw material, immediately it has been measured, becomes the property of the manufacturer, the element commonly called 'manufacturing charges' is his calculation of the expenses of manufacture and marketing, and provision for his profit. These expenses cannot possibly be constant, because the butter is sold not only in Australia, but to numerous buyers in Great Britain and the East, and it rarely happens that all butters command exactly the same price. The manufacturer aims to allow a margin that on the average will be adequate. No instance is known to members of my Committee of parties who carry no financial responsibility for the operations involved being given even partial control of an industry. It is true that Parliament regulates the charges of such monopolies as the gas and electric light industries in this State, but this power is exercised because of the privilege of monopoly which Parliament grants the companies rendering these services. When the producer asks for control of the commercial functions in the dairy industry he is not in a position to confer upon the manufacturer any compensating protection. The manufacturer is left open to the full blast of free competition and the risks of the general economic situation. It is he who in the long run has to meet his wages bill and his obligations to his creditors, and consequently he holds that demands for control of his ordinary commercial operations can find no support in either equity or precedent. Furthermore, the existence of a Government Butter Factory and the active presence of its representative upon the Price-fixing Committee is sufficient guarantee that manufacturers are not extracting unjustifiable profits from the industry. If this were so it would be reflected in the trading results of the Government-owned factory, but reference to the report of the Parliamentary Standing Committee on Public Works on the Port Adelaide Freezing Works and Butter Factory, and to subsequent reports of the Auditor-General, will show that its profits from the manufacture of butter, even when they occur, are negligible. This is an important fact, because the Government Butter Factory was intentionally established as a 'check' factory. Also on the Price-fixing Committee are the representatives of two large co-operative organisations established and controlled by primary producers. In fact, we can think of no other industry in the State where the sellers of a raw material have such facilities for exercising influence upon the buyers of the product as they have in the butter trade. The foregoing remarks cover the questions raised by the resolutions 1 and 3.

"All that need be said in respect of resolution 2 is that for several months factories have been so notifying suppliers, and have even gone to the extent of enlisting the assistance of the Government Dairy Inspector to see that the policy is carried out in a thorough manner.

"Finally, we refer to your request for a statement showing how the price of butterfat in Adelaide is reconciled with the London price of butter, and here we are confronted with the principle dealt with above. We have not heard of wheatgrowers claiming a right to demand an explanation from merchants as to how the local price of wheat is reconciled with the price in Liverpool or Chicago, or similar demands from the breeders of cattle and the growers of apples. All merchants are compelled to take into consideration a multitude of factors, all of which may, and frequently do, vary from day to day, so that it requires a close knowledge of the particular brand of commerce concerned even to be able to follow the calculations involved. An explanation that holds good to-day may not apply correctly at another date, and in setting out the position at any given time there is a danger that when departures from it are observed they will be regarded suspiciously by outsiders not familiar with the factors operating. Consequently you will see that your last request confronts the members of my Committe with two difficulties—(1) They do not grant that they, more than any other merchant or manufacturer, are required to make public their commercial calculations; and (2) they are alive to the danger of any such information, if given, being gravely misinterpreted by those unfamiliar with the countless factors bearing upon their affairs. But although firmly maintaining this position, they desire to work amicably with all other sections of the industry, and in the hope that a concession to your request on this occasion will help towards this end they have authorised me to give merely as an instance the method followed in establishing the price on Monday afternoon, the 18th July, this information being set out in the attached statements."

1. PRICES—GENERAL STATEMENT.

My Committee incline to the view that many of the confused ideas regarding the price of butter arise from the fact that the prices shown in the cabled market reports from London are accepted by readers as if these were the actual prices realizable instantaneously by manufacturers for stocks in Adelaide. It should always be remembered that the cables give only the price of butter actually "on spot" in London, whereas butters leaving the South Australian factories at that date cannot arrive in London until six weeks later. Owing to this delay it is fallacious to attempt to find absolute agreement at any given date between London and Adelaide prices. If a long period is taken for comparison, a complete year for instance, a close agreement will be found to exist.

South Australian butter manufacturers, as well as those in other States, have found that because of this constant fluctuation in the London price, the figure offered by London merchants for butter F.O.B. Adelaide or C.I.F. & E. constitutes in the long run the most reliable basis from which to work prices.

The attached statement "A" is a calculation of the price realised by the manufacturer on the basis of sales at 103s. (sterling) per cwt. in London for butter sent to that market on consignment.

Statement "B" is a similar calculation on the basis of C.I.F. & E. London sales at 101s. (sterling).

These prices have been adopted for illustration because, as indicated in the final paragraph of our letter, they formed the basis adopted by the Committee in establishing the local price on the 18th instant. Normally the price is fixed every Monday afternoon on the quotation then ruling. The fluctuating nature of the London market already referred to makes variations during the week inevitable, but, as will be readily realised, the average is found to be fair. It is an impossible ideal to make the local market move in detailed sympathy with the London market. To illustrate this aspect of the question, although 101s. C.I.F. & E. was taken as a basis for the week commencing the 18th instant, in the latter part of the week 99s. was the maximum price obtainable. In this manufacturers suffered, but, of course, compensation comes when the movement is in the other direction. It is, to repeat, the average position that must always be used as a basis for comparison.

2. Statement A.

Net return of manufacturers of butter shipped on consignment and sold in London for 103s. per cwt., which was the spot price in London last week.

		Shillings Per Cwt.
Choicest butter sold in London		103.00
Less London charges, including port dues, lighterage, landing, housing, delivering, rent, cabling, trade discount, commission, and Del-credere risk—which average 4¾ per cent.		4.89
		98.11
Plus 25 per cent. exchange		24.52
		122.63
Deduct freight to London, 8s. per cwt., plus 18 per cent.	9.44	
Insurance at 6s. 10d. per cent., plus 25 per cent.	.41	
		9.85
		112.78
Add Paterson bounty		28.00
		140.78
Less Australian charges (cost of cases, freezing, wharfage, cartage to Outer Harbor and putting aboard, Commonwealth grading fee, and Dairy Council levy)		6.83
		133.95
Less levy to Paterson plan		16.33
		117.62

Net price to manufacturer in Adelaide on butter sent on consignment and sold in London at 103s. per cwt. would be 117s. 7d. per cwt. in Australian currency.

3. STATEMENT B.

Net value to manufacturer—in Australian currency—of butter sold at 101s. per cwt. C.I.F. & E., London.

		Shillings Per Cwt.
Value of choicest butter		101.00
Deduct London selling agent's commission of 1 per cent.		1.01
		99.99
Add exchange at 24.75 per cent., this being the rate obtained on demand draft		24.75
		124.74
Deduct freight to London at 8s. per cwt., plus 18 per cent.	9.44	
Insurance at 6s. 10d. per cent., plus 25 per cent.	.41	
		9.85
		114.89
Deduct Australian charges (cost of cases, freezing, wharfage, cartage to Outer Harbor and putting aboard, Commonwealth inspection fee, and Dairy Council levy)		6.83
		108.06
Add Paterson scheme bounty		28.00
		136.06
Less levy to Paterson plan—1¾d. per lb.		16.33
		119.73

Which is equivalent to 1.83s., or 12.83d. per lb. net to the manufacturer. As the price being paid by most manufacturers for butterfat is 1s. per lb., it will be seen that from the "over-run" the manufacturer received 2.66d. per lb. to cover the cost of manufacture, interest, depreciation, and profit.

The foregoing shows the result, as already stated, where the manufacturer actually secured 101s. for his butter—not all manufacturers succeeded in doing this.

AGRICULTURAL BUREAU CONFERENCES.

Conferences of the Branches of the Agricultural Bureau situated on Eyre's Peninsula were held at Kimba, Wudinna, and Cummins on October 3rd, 5th, and 7th respectively. Departmental officers present were:—Professor Perkins (Director of Agriculture), Messrs. W. J. Spafford (Deputy Director), H. B. Barlow (Chief Dairy Instructor), C. T. McKenna, B.V.Sc. (Veterinary Officer Stock and Brands Department), H. D. Adams and W. H. Brownrigg (Agricultural Instructors), and H. C. Pritchard (General Secretary Agricultural Bureau).

THE KIMBA CONFERENCE (EASTERN EYRE'S PENINSULA).

The Kimba Conference was poorly attended, only four Branches sending representatives, viz., Kelly, Pinkawillinie, Balumbah, and Balumbah Women's.

Mr. T. H. Harris presided, and the Conference was opened by Professor Perkins who congratulated the State, and the Kimba district in particular, on the prospects of a good season. Last year Eyre's Peninsula produced 10,000,000bush. of wheat and he was confident that the ensuing harvest would be greater. In many instances good seasons were freak years, and there was need for caution in basing farming practices on the experiences of those years. He regarded South Australia as a country of relatively low rainfall with a short growing period, and all farming practices were built up on that point of view. The most successful farmer was one who was able to judge the results of average seasons and who carried out his practices accordingly. Last year the State had a mean yield of 11¾bush. per acre, and in 56 years there were only six years with a higher average, and it would be wrong to base farming practices on a season such as was experienced last year. It was known, for example, that early, well worked fallow gave higher yields than late tillage, but in good years the latter might be of greater advantage. In an average year good results were not obtained without superphosphate. If certain varieties succeeded well only in a good season it was folly not to sow varieties which were known to give the best results in average years. For these reasons alone he considered that farmers should be aware of being tempted to change their practices on the experience of a good season. It was satisfactory to note that side lines had been taken up in this part of the State. Whilst the market conditions were not satisfactory for eggs and fat lambs, it was gratifying to know that farmers on Eyre's Peninsula were, at any rate, obtaining prices for their cream at Port Lincoln equal to Port Adelaide prices.

Papers were read by Mr. G. W. Cant (Kelly) on "Starting on a Virgin Scrub Block"; Mr. A. Jericho (Balumbah), "Dairying in this District"; Mr. F. A. Gallaway (Kelly), "Farming Records"; and Mr. F. Masters, "Development of Mallee Farms."

Questions were answered by Departmental officers, and the following resolutions were carried:—

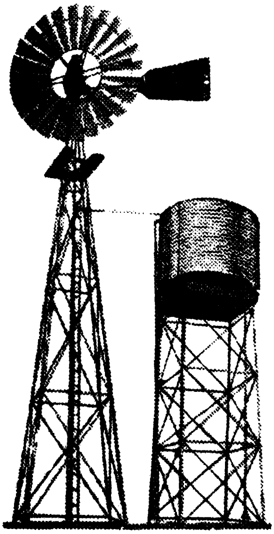
That the next Conference be held in July at Cowell under the auspices of the Miltalie Branch.

That this Conference urges the Farmers' Relief Board to grant super sufficient to dress land as recommended by Departmental officers.

That the price of superphosphate be reduced.

Metter's Master "Nuoil" Windmills

AGAIN AWARDED FIRST PRIZE, ADELAIDE SHOW, 1932.



Most Reliable, Efficient, and Durable.
Positively Self Governed.
Greater Lifting Strength.
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Equipped with interchangeable and replaceable bearings of high-class anti-friction metal.

MANUFACTURED IN SOUTH AUSTRALIA BY

Metters Limited,
NORTH TERRACE, ADELAIDE.

"No fear of a Drought
With a Metters about."

That this Conference recommends that a further grant on the same lines as the £20,000 just allotted be made available for farm employment in order to increase primary production, exports, and revenues of the State.

That the Kimba District Council be asked to enforce the Noxious Weeds Act.

That this Conference recommends that the Department of Agriculture establish experimental plots in the Kimba district for testing the values of pastures suitable for the locality.

That this Conference protests against the unfair treatment of telephone subscribers who are cut off from a house where a service has been established, but has been disconnected owing to the inability of the proprietor to pay his rent and calls.

That this Conference endeavors to influence the Government to destroy rabbits on water conservation reserves.

That the Government be asked to provide settlers adjoining unoccupied land with wire netting through district councils or the vermin board on the old terms.

Mr. C. T. McKenna delivered an instructive address on the "Care of Farm Animals" and replied to numerous questions relating to stock complaints.

THE WUDINNA CONFERENCE (CENTRAL EYRE'S PENINSULA).

There was a fair attendance at Wudinna when Mr. A. W. H. Barnes presided over the Conference of representatives of Branches from Wudinna, Minnipa, Pygery, Pinbong, and Kyancutta.

The Conference was opened by Professor Perkins, who stated that prices for wheat were slowly approaching the cost of production, which varied from district to district, from season to season, and from farm to farm. A good deal depended on individual management, but the yield was, of course, a more important factor in production cost. For 70 years the average in South Australia was a little over 8bush. In recent years the average was slightly better owing to the extension of good farming methods. More farmers have approached the standard of the most successful farmers of the State and in consequence the yields were slightly increased.

Papers were read by:—Mr. C. W. Johns (Wudinna) on "Pigs on the Farm," Mr. A. J. Shepherd (Wudinna) on "Practical Breeding of Draught Horses," and Mr. J. F. Heylen (Pygery) on "Why Fallow and Rotation Cropping."

Discussions arose on the bulk handling of wheat, the advantages of establishing a butter factory in the district, and the best means of using the services of Agricultural Instructors. The following resolutions were carried:—

"That this Conference urges the Government to hasten the Committee's report on bulk handling of wheat, meanwhile giving the Farmers' Union every facility to ship bulk cargoes for the coming season."

"That efforts be made to have the butter factory at Port Lincoln reopened."

"That the Government provide facilities *re* cool storage in trains for the handling of cream and other produce to Port Lincoln."

"That the Government be asked to make provision for receiving eggs at the Port Lincoln Produce Depot."

"That a yearly programme of meetings and visits for Mr. Brownrigg be drawn up and that the formulating of the scheme be left in the hands of Mr. Brownrigg."

"That the title of Agricultural Instructor be altered to Agricultural Adviser."

"That the Advisory Board of Agriculture make inquiries as to the reason why so many bags were undersized and not capable of holding 3bush. of wheat last season."

In the evening Mr. Spafford gave an address on "Recent Research Work in Connection with the Cultivation of Wheat."

Minnipa, Kyancutta and Poochera were mentioned as the place to hold the next Conference, and Minnipa was eventually decided upon.

The Cummins Conference (Lower Eyre's Peninsula).

The morning session at the Cummins Conference was poorly attended, but the number of delegates increased during the afternoon and evening. Mr. G. W. Proctor presided and the Branches represented were Cummins, Yeelanna, Koppio, Kapinnie, and Green Patch. In his opening address Professor Perkins stated that in the Southern Districts of Eyre's Peninsula there were many men who had distinguished themselves in agricultural work. Within recent years the Denton trophy at the Royal Show in Adelaide had been won by Mr. W. E. Cooper in 1929, by Messrs. Lawrie Bros. in 1930 (who were also runners up in 1931 and in 1932), and by Mr. R. Kain in 1932. At this year's Royal Show Mr. R. R. Wilson exhibited the best bag of malting barley. In the competition for the Champion Shield donated by the Royal Agricultural and Horticultural Society for the best wheat crop in the State, Messrs. Smith Bros., Yeelanna, were placed third in order of merit in 1927, Messrs. Aikenhead and Treloar third in 1929 and second in 1931. Farmers in the district were contributing in no small measure to the welfare of the State, and given adequate marketing facilities the district was suitable for the development of farm sidelines.

Mr. M. A. Palm (Cummins) read a paper on "Rabbit Destruction," Mr. T. D. Vogt (Yeelanna) on "Fallowing," Mr. W. E. Bryant (Cummins) on "Preparation of the Wool Clip," Mr. F. J. Jericho (Cummins) on "Green Fodders," and Mr. W. P. Cooper (Koppio), "Does it Pay to Raise Lambs for the Freezers?".

Instructive discussions arose on questions asked by Branches on subjects relating to the advantages in feeding off early sown rank crops, the benefits gained from early fallow and other matters of interest to farmers in the district.

The following resolutions were carried:—(1) "That this Conference requests the Advisory Board of Agriculture to ask superphosphate manufacturers to make a reduction of 5 per cent. for cash with order on established trading custom." (2) "That the Government improve the marketing facilities of poultry farmers on Eyre's Peninsula to enable them to produce at a profit and extend the industry." (3) "That special Government grants be allotted for making roads in the Cummins-Yeelanna district owing to the shocking state of same and the great disabilities primary producers have to work under through this cause." (4) "That oil used for farming operations be included in the list of exemptions of sales tax, which would mean a great relief to primary producers, especially those engaged in power farming." (5) "That the Associated Banks be asked to remove the double increase of exchange on Eyre's Peninsula cheques;" and (6) "That the next Conference be held at Cummins."

In the evening Mr. H. B. Barlow (Chief Dairy Instructor) addressed the Conference on "Dairying and Pig Raising."

The average production of dairy cows in Great Britain is 574 gallons of milk a year; in Denmark, 571 gallons; Germany, 520; Norway, 445; Australia, 290 gallons.

THIS SHOWS THE URGENT NECESSITY FOR IMPROVING METHODS OF FEEDING IN AUSTRALIA WITHOUT DELAY.

USE

MEGGITTS

LINSEED

MEAL

FOR DAIRY COWS

ADVISORY BOARD OF AGRICULTURE.

The Monthly Meeting of the Advisory Board of Agriculture was held on Wednesday, October 19th, there being present Messrs. H. N. Wicks (Chairman), A. M. Dawkins, S. Shepherd, A. L. McEwin, J. W. Sandford, P. J. Baily, Professor Perkins (Director of Agriculture), and H. C. Pritchard (Secretary). Apologies were received from Messrs. A. J. Cooke, F. Coleman, and J. B. Murdoch.

Congress Addresses.—It was unanimously decided to extend the sincere thanks of the Board to private contributors to the Congress Agenda for the valuable support they rendered in the Congress proceedings.

Congress Agenda.—It was decided to give effect to the resolutions of Congress that the Agenda be sent out to Branches six weeks before the Annual Congress.

Tariff on Superphosphate.—The Board supported the Congress resolution that superphosphates should be admitted free of duty, and the Secretary was instructed to forward the resolution to the Minister accordingly.

Imported Journals.—Congress resolution: "That the restriction on the importation from America of farm journals be removed." The Secretary reported that the main cause of the high price of literature imported from America was the exchange rate, which he was informed was about 65 per cent. As this was beyond the control of the Board no further action was deemed necessary.

Price of Superphosphate.—Congress Resolution: "As superphosphate was so very essential for the production of wheat and fodders, we consider that a reduction in the price is long overdue. Manufacturers have demanded spot cash for the last two seasons which should enable them to sell at a lower price." It was decided to bring this under the notice of manufacturers.

Barley in Wheat Crops.—Attention was drawn to the alarming extent to which barley was present in wheat crops this season. The Director of Agriculture intimated that he would draw the attention of Agricultural Instructors to this matter and that he would call for reports on the subject.

New Branches.—Conditional approval was given to the formation of a branch at Chilpuddie Rock and a Women's Branch at Mundalla.

Transfer of Branch.—The Board approved of the transfer of the Yorketown Branch to Coobowie.

Life Members.—The following gentlemen were approved as Life Members of the Agricultural Bureau:—Messrs. H. Bowyer (Owen), H. Schultz (Lenswood), R. Wheaton (MacGillivray), H. G. Mackley (Mangalo), E. B. Pitman (Murraytown), and J. B. Makin and W. H. Morcomb (Keith).

New Members.—The following were approved as members of the undermentioned Branches:—Kuitpo—S. R. Gray, G. Allington, W. F. Wilson, G. P. Barker, E. Steer, R. L. Vining, R. Morris, V. Ladhams, T. Dixon, H. Stone; Mangalo Women's—Miss A. James; Upper Wakefield—Paul Glynn; Boors Plains—V. A. H. Prider; Port Elliot—M. A. Littleby; Longwood—Les. Lewis; Kybybolite—B. Paltride, S. H. Castine, H. L. Miles, S. Heffernan, T. Boord; Pinnaroo Women's—Mrs. H. Gilbert, Mrs. G. Pierce; Tatiara—Glen D. Ferguson; Kangarilla—H. C. Dowling; Alawoona—S. Coad; Hindmarsh Island—K. Barclay; Paruna—John Stewart, A. Hinton; Macclesfield—A. Read, K. Read; Greenock—E. W. Nitschke, A. Auricht, J. Jungfer; Clare Women's—Mrs. M. Somerville; Barmera—O. J. Mayger, W. Mutton, J. Pasturel, L. J. Gordon, Ki Ki—A. F. Kiddle; Wilmington—R. C. Cooley, M. L. George; Yaninee—J. L. Roe, F. E. Christian; Mount Hope—E. Russell, L. A. Myers, A. D. Myers; Hoyleton—Roy Sandow; Belalie Women's—Mrs. B. McCarthy; Auburn Women's—Mrs. J. Tansell, Mrs. E. J. Sandow; Aldinga—S. Blacker, Jack Blacker; Gawler River—E. W. Linke, R. White; Taplan—W. Axon; Balaklava—R. H. Shepperd; Weavers—G. T. Anderson, W. G. Agnew; Redhill—Lance Harris; Morchard—F. Stainer; Black Rock—C. Judell,

R. Thomas, Geo. Crowhurst; Owen—G. Poole, S. Lacey; Jervois—L. Railz, J. E. Richards; Hartley—A. B. Brook; Mount Barker—W H. Boyce, T. G. Paternoster; Cummins—Roy Feirclough, Leigh Rough, Hans Kahl; Bowhill—T. W. Morton, G. Morton; Mundalla—E. J. Pavier, A. H. Lucas; Williamstown Women's—Mrs. Wm. Patterson, Mrs. M. Adams; Lenswood and Forest Range—C. Filsell, O. Probert, — Robinson, W. Fry; Taplan—R. Venning, R. Turner; Lameroo—J. Opie, G. Priest; McLaren Flat Women's—Mrs. R. Elliott, Mrs. E. Broughton; Millicent Women's—Mrs. P. Sullivan; Penola Women's—Mrs. J. N. McBain, Mrs. W. Patterson, Mrs. J. Skinner, Mrs. E. R. Ey; Blackwood—C. J. M. Wakefield, J. H. Wakefield; Mount Gambier—G. R. Hellyer, L. R. Headlam; Cummins—John Pedler, P. L. Vanstone, A. Hill, C. Hill, Jas. Rundle; Pinbong—Eric Scholz; Stockport—R. Koch, L. Koch, E. Koch; Modbury—J. R. McPherson; Moorlands—Jack Jaensch; Williamstown—F. Adams, D. Gordon; Balaklava—N. Harley; Yantanabie—Bruce Miller, N. B. Miller, C. G. Miller; Mangalo—R. Hughes, L. Hannemann, M. Evely; Wynarka—G. Martin, C. S. Hall, A. Dalziel, J. H. Priest; Wirrilla—W. B. Hendry; Jamestown—B. McCarthy, H. C. Cavenett; Stanley Flat—L. L. Dux, W. Slattery, J. Slattery, E. F. Ward, S. C. Lee, A. McAskill, R. McDonald, S. McDonald, C. H. Walden, E. W. Burch, E. Burch; Hope Forest—G. Hurst, A. Lewis, F. Bowen, J. Barclay, E. Edmonds, K. Searle, C. Fisher, H. Nielsen, G. Bevan, J. McGee, S. Coad, T. Finchen, F. Eves, W. Catlin, E. Muldoon; Balumbah Women's—Miss Mona Roe, Miss Alice Norris, Miss O. Deer, Miss Alice Deer.

New members, 155; present members, 8,019; No. of Branches, 320.

Meetings.—It was decided that, in future, meetings will be held at 2 p.m. instead of 2.30.

A large number of resolutions from Congress and Conferences was considered in Committee, and Branches will be advised from time to time as to the consideration and recommendations made in connection with such resolutions.

METROPOLITAN ABATTOIRS, ADELAIDE

MANUFACTURERS OF

Meat Meal for Pigs

Read Report of Trials made by PROF. PERKINS,
Journal of Agriculture, January and July, 1921.

Meat Meal for Poultry

For full information on above write to

The GENERAL MANAGER, Metropolitan Abattoirs Board,
Box 573E, G.P.O., Adelaide.

ALSO MANUFACTURED—

Blood Manure Bone Manure

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co., Limited, reported on November 1st, 1932:—

Butter.—The production of butter in South Australia during October was greater than in any other season in the history of the State, and the weather conditions being congenial, it is anticipated that supplies will be well maintained well through November. There is an abundance of feed in all areas, so that the dairy herds are in splendid condition throughout, and with the keener attention which is being given to dairying, it is of great benefit to the man on the land and the State as a whole. Heavy quantities continue to be shipped to Britain, but it is unfortunate that prices ruling there are lower than they have been for many years, so that the returns to the farmer are less than it was hoped would be the case. At this time of the year local values are entirely governed by export, and values have eased throughout the month and at date were—Choicest creamery fresh butter, in bulk, 1s. 0¾d.; prints and delivery, extra (these prices are subject to the stabilsation levies); store and collectors, 7d. to 7½d. per lb. at store door, less usual selling charges.

Eggs.—Whilst the cool weather conditions have been favorable for dairying, it has had the effect of shortening egg production, for with changeable temperatures, such as we have had this season, the laying hens are affected. The result has been that the percentage of eggs which is suitable for shipment was greater than usual, and has temporarily shortened the supplies available for pulping and Australian trade generally. It is expected, however, that as soon as the warm weather sets in that there will be an immediate response in production. Meanwhile the market is steady. Ordinary country eggs, hen or duck, 5d. per dozen; selected, tested, and infertile higher.

Cheese.—The tonnage of cheese being manufactured at present is also creating new records, and as the South-Eastern parts are usually several weeks later in seasonal conditions, it is expected tht the cheese manufactured will continue at a high level for a good many weeks yet. This commodity also is being shipped as freight can be arranged, but under the influence of weakening butter prices values have eased. New makes, large to loaf, 7d. to 7½d.; semi-matured and matured, 9d. to 11d. per lb.

Bacon.—The consumption of bacon has kept up very well throughout the month under review, but the curers kept the market well supplied from week to week. Rates also continued steady. With the nearer approach of Christmas, manufacturers are now preparing hams for the trade, and a keener demand was experienced for these, many storekeepers booking their requirements for delivery at little later on. Best local sides, 8½d. to 9d.; best local factory-cured middles, 8½d. to 9d.; large, 8d.; local rolls, 8½d. to 9d.; local hams (raw), 11½d. to 1s.; cooked, 1s. 2d. to 1s. 3d.; lard, prints, 6d. per lb.

Almonds.—A splendid demand for almonds continued throughout the month, but the suppiles to hand were somewhat limited. With buyers unable to obtain all their requirements, it might have been expected that values would have firmed, but owing to the importations of kernels into Australia which will be landed during the next few weeks, this has steadied the values here. Brandis and softshells, 9½d. to 10½d.; hardshells, 6d. to 6½d.; kernels, 2s. 1d. to 2s. 2d. per lb.

Honey.—Except for the local trade there has not been any very heavy sales made interstate. Reports from other parts of the Commonwealth indicate that the stocks of honey are sufficient for their needs, so that there has not been the same call for South Australian honey as in some other years, and it looks as though overseas trade will have to be developed to clear stocks during the coming years. Prime clear extracted, in liquid condition, 3d. to 3½d.; second grade, 2d. to 2½d. per lb.

Beeswax.—Again met with good demand throughout the month, and fairly heavy consignments were received—1s. 0½d. to 1s. 11d. per lb., according to sample.

Live Poultry.—The supplies of live poultry throughout October were somewhat shorter than just previously, but this is usual, as with farmers preparing for harvesting they have not the time necessary for cooping and marketing birds. Towards the latter end of the month supplies improved, but the increase was largely in old and light weight hens, and values were a shade easier for these. Prime roosters, 4s. to 5s. 4d.; nice conditioned cockerels, 3s. 3d. to 3s. 9d.; fair conditioned cockerels, 2s. 8d. to 3s. 1d.; chickens lower; heavy weight hens, 2s. 9d. to 3s. 9d.; medium hens, 1s. 11d. to 2s. 6d.; light hens, 1s. 4d. to 1s. 8d.; couple of pens of weedy sorts lower; geese, 4s. to 4s. 9d.; prime young Muscovy drakes, 4s. to 5s.; Muscovy ducks, 2s. to 3s. 3d.; ordinary ducks, 1s. 8d. to 2s. 6d.; ducklings lower; turkeys, good to prime condition, 8d. to 9½d. per lb. live weight; turkeys, fair condition, 6½d. to 7½d. per lb. live weight; turkeys, fattening sorts, lower; pigeons, 3½d. to 5d. each.

Potatoes.—4s. 9d. per cwt.

Onions.—New season's, 13s. per cwt.

RAINFALL TABLE

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of, and to the end of October, 1932, also the average precipitation to the end of October, and the average annual rainfall.

Station.	For Oct., 1932.	To end Oct., 1932.	Av'ge to end Oct.	Av'ge Annual Rainfall.
Far North and Upper North.				
Oodnadatta	0·24	3·80	3·90	4·75
Marree	1·34	6·15	4·70	5·93
Farina	1·28	6·33	5·42	6·48
Copley	0·95	6·76	6·66	7·95
Beltana	0·78	6·20	7·11	8·59
Blinman	1·10	8·48	10·22	12·00
Hookina	0·78	9·27	9·60	11·42
Hawker	0·68	11·90	10·56	11·42
Wilson	0·73	11·98	10·05	12·23
Gordon	0·44	9·15	8·95	10·69
Quorn	1·14	13·56	11·63	13·35
Port Augusta	0·98	11·95	8·15	9·42
Bruce	0·88	10·50	8·32	9·90
Hammond	0·73	13·44	9·70	11·33
Wilmington	1·32	16·96	15·54	17·50
Willowie	1·12	15·10	10·59	12·16
Melrose	1·73	27·93	20·58	22·89
Booleroo Centre	1·09	19·00	13·33	15·20
Port Germein	0·81	18·17	10·80	12·45
Wirrabara	1·82	25·81	17·10	19·27
Appila	1·38	19·23	12·81	14·69
Cradock	0·53	9·79	9·30	19·27
Carrieton	0·79	10·14	10·54	12·35
Johnburg	0·68	9·50	8·91	10·63
Eurelia	0·80	11·96	11·12	13·06
Orroroo	1·24	13·86	11·43	13·24
Nackara	0·35	10·23	9·59	11·16
Black Rock	0·86	12·42	10·64	12·46
Oodlawirra	0·44	12·65	9·50	11·62
Peterborough	0·64	15·88	11·23	13·24
Yongala	0·72	16·90	12·36	14·44
North-East.				
Yunta	0·05	10·15	7·04	8·43
Waukaringa	0·18	6·75	6·88	8·00
Mannahill	0·45	5·03	6·87	8·30
Cockburn	0·11	5·78	6·68	7·91
Broken Hill, N.S.W.	0·16	5·39	8·18	9·58
Lower North.				
Port Pirie	0·87	17·75	11·61	13·19
Port Broughton	0·89	12·83	12·52	13·93
Bute	1·86	18·64	13·90	15·38
Laura	1·90	21·88	15·99	17·99
Caltowie	1·11	19·34	14·71	16·74
Jamestown	0·83	19·68	15·55	17·75
Gladstone	1·80	18·44	14·39	16·32
Crystal Brook	1·51	17·71	14·04	15·81
Georgetown	2·04	21·29	16·37	18·39
Narridy	1·95	17·29	14·11	15·89
Redhill	1·36	19·42	14·81	15·56
Spalding	0·80	18·58	16·68	19·13
Gulnare	1·52	22·55	16·47	18·62
Yacka	1·38	18·48	13·61	15·32
Koolunga	1·32	16·16	13·66	15·43
Snowtown	1·28	18·19	14·04	15·62
Lower North—*continued.*				
Brinkworth	1·81	18·69	13·97	15·74
Blyth	1·42	17·50	14·91	16·76
Clare	1·95	26·08	22·09	24·54
Mintaro	1·63	24·02	21·12	23·34
Watervale	2·22	25·77	24·23	26·91
Auburn	2·03	24·20	21·58	24·00
Hoyleton	1·78	17·40	15·38	17·33
Balaklava	1·20	14·38	13·72	15·52
Port Wakefield	2·13	13·89	11·59	12·96
Terowie	1·07	15·82	11·38	13·39
Yarcowie	0·57	16·39	11·82	13·63
Hallett	0·59	20·38	14·36	16·43
Mount Bryan	0·99	21·83	14·75	16·70
Kooringa	0·89	19·57	15·99	17·90
Farrell's Flat	1·01	19·31	16·71	18·66
West of Murray Ranges.				
Manoora	1·30	21·68	16·72	18·82
Saddleworth	1·48	22·15	17·41	19·54
Marrabel	1·71	22·63	17·75	19·83
Riverton	1·54	22·38	18·61	20·73
Tarlee	1·75	17·99	16·03	18·09
Stockport	1·85	19·86	14·86	16·80
Hamley Bridge	1·90	19·13	14·64	16·55
Kapunda	1·50	20·16	17·66	19·81
Freeling	1·89	18·44	15·84	17·87
Greenock	2·06	20·93	19·18	21·60
Truro	1·25	18·42	17·88	20·02
Stockwell	1·41	20·56	17·85	20·15
Nuriootpa	2·41	23·26	18·40	20·62
Angaston	2·02	21·95	20·04	22·43
Tanunda	2·25	21·35	19·81	22·04
Lyndoch	2·61	22·89	21·20	23·48
Williamstown	3·18	28·17	25·23	27·63
Adelaide Plains.				
Owen	1·67	14·88	12·93	14·00
Mallala	2·76	17·30	14·78	16·59
Roseworthy	2·56	19·29	15·50	17·32
Gawler	2·72	18·74	17·02	18·99
Two Wells	2·54	17·43	14·04	15·74
Virginia	2·54	18·99	15·27	17·14
Smithfield	2·66	21·49	15·59	17·42
Salisbury	2·08	21·13	16·62	18·55
Adelaide	2·32	24·40	18·95	21·09
Glen Osmond	2·55	27·92	23·55	25·95
Magill	2·50	28·76	22·96	25·49
Mount Lofty Ranges.				
Teatree Gully	2·50	27·11	24·50	27·29
Stirling West	3·65	49·51	42·90	46·78
Uraidla	3·72	53·28	40·17	43·82
Clarendon	2·46	35·60	29·90	32·80
Morphett Vale	2·06	23·57	20·44	22·59
Noarlunga	1·60	22·74	18·54	20·33
Willunga	2·40	26·71	23·87	25·13
Aldinga	2·14	22·53	18·43	22·09

RAINFALL—*continued.*

Station.	For Oct., 1932.	To end Oct., 1932.	Av'ge to end Oct.	Av'ge Annual Rainfall.
MOUNT LOFTY RANGES—*contd.*				
Myponga	1·93	32·12	27·00	28·94
Normanville	2·00	21·30	18·91	20·67
Yankalilla	2·10	23·50	20·92	22·80
Mount Pleasant	2·29	29·57	24·80	27·21
Birdwood	2·09	31·98	26·51	29·16
Gumeracha	2·80	34·82	30·36	33·36
Millbrook Rsvr.	2·24	32·99	31·51	34·95
Tweedvale	2·73	38·43	32·91	35·83
Woodside	2·63	33·93	29·46	32·23
Ambleside	2·25	35·15	31·86	34·88
Nairne	2·44	30·92	25·52	28·13
Mount Barker	2·95	43·77	28·94	31·71
Echunga	2·63	37·90	30·28	33·14
Macclesfield	2·47	29·64	27·73	30·46
Meadows	2·71	37·99	32·83	36·10
Strathalbyn	2·33	17·62	17·40	19·35
MURRAY FLATS AND VALLEY.				
Meningie	2·16	20·36	16·54	18·42
Milang	1·97	16·70	13·31	14·96
Langhorne's Crk.	2·35	18·10	12·93	14·76
Wellington	1·66	20·90	12·81	14·58
Tailem Bend	2·42	22·56	12·78	14·61
Murray Bridge	1·99	15·51	11·93	13·68
Callington	1·62	15·72	13·49	15·25
Mannum	1·54	14·42	10·14	11·51
Palmer	1·66	18·40	13·69	15·49
Sedan	0·86	11·39	10·79	12·16
Swan Reach	0·56	10·63	9·24	10·61
Blanchetown	0·54	10·00	9·63	11·08
Eudunda	1·04	19·32	15·10	17·12
Sutherlands	0·50	12·30	9·34	10·80
Morgan	0·33	9·11	7·80	9·20
Waikerie	0·46	9·53	8·29	9·69
Overland Corner	0·11	8·01	8·83	10·47
Loxton	0·79	11·74	10·07	11·64
Renmark	0·43	9·70	8·96	10·50
WEST OF SPENCER'S GULF.				
Eucla	0·13	8·55	8·84	10·04
Nullarbor	1·82	13·14	7·78	8·66
Fowler's Bay	2·03	17·52	10·94	11·70
Penong	1·48	15·82	11·11	11·84
Koonibba	2·93	17·20	10·71	11·46
Denial Bay	1·28	11·43	11·37	10·96
Ceduna	1·17	13·66	8·92	9·75
Smoky Bay	0·79	13·39	9·40	10·20
Wirrulla	0·92	13·76	9·19	9·57
Streaky Bay	0·94	17·51	13·76	14·80
Chandada	0·93	15·06	—	—
Minnipa	1·20	17·57	12·54	13·55
Kyancutta	1·42	16·36	—	—
Talia	0·93	17·06	13·31	14·56
Port Elliston	1·49	21·85	15·20	16·34
Yeelanna	1·31	21·93	14·53	15·73
Cummins	2·07	21·72	16·00	17·46
Port Lincoln	1·60	25·02	17·81	19·37
Tumby	2·87	19·37	12·26	14·00
Ungarra	1·08	18·07	14·97	16·70
Carrow	1·25	13·93	11·34	13·10
Arno Bay	1·44	16·56	11·08	12·40
WEST OF SPENCER'S GULF—*continued.*				
Rudall	0·92	17·31	10·74	12·26
Cleve	1·12	20·84	13·09	14·62
Cowell	0·47	11·51	9·90	11·14
Miltalie	0·90	17·72	12·10	13·56
Darke's Peak	1·40	20·20	13·38	14·86
Kimba	0·93	16·00	10·40	11·53
YORKE PENINSULA.				
Wallaroo	1·03	19·10	12·82	13·90
Kadina	1·11	19·70	14·21	15·63
Moonta	1·21	17·07	13·65	15·06
Paskeville	1·51	17·78	14·09	15·52
Maitland	2·47	23·08	18·11	19·91
Ardrossan	2·58	16·36	12·59	13·95
Port Victoria	3·12	19·63	13·87	15·40
Curramulka	1·60	20·98	16·28	17·88
Minlaton	1·67	20·26	16·24	17·82
Port Vincent	1·66	16·73	12·92	14·49
Brentwood	1·59	19·44	13·94	15·44
Stansbury	1·82	17·92	15·35	16·80
Warooka	1·60	18·56	16·16	17·53
Yorketown	1·35	17·16	15·46	16·93
Edithburgh	1·95	19·25	14·81	16·36
SOUTH AND SOUTH-EAST.				
Cape Borda	1·96	26·95	23·06	24·77
Kingscote	1·38	20·80	17·47	19·10
Penneshaw	1·41	20·59	17·02	18·16
Victor Harbor	2·73	27·01	19·33	21·26
Port Elliot	2·80	21·26	18·00	19·94
Goolwa	2·77	21·22	16·01	17·81
Copeville	0·96	13·43	9·86	11·42
Meribah	0·51	13·29	10·00	11·21
Alawoona	0·63	12·14	8·89	10·02
Mindarie	1·06	16·52	10·29	11·89
Sandalwood	0·92	15·74	11·79	13·59
Karoonda	1·07	16·15	12·61	14·34
Pinnaroo	0·77	14·61	12·75	14·62
Parilla	0·88	15·24	12·25	13·91
Lameroo	0·92	15·97	14·17	16·16
Parrakie	1·23	17·95	12·79	14·51
Geranium	1·23	18·79	14·51	16·44
Peake	1·75	17·20	14·25	16·21
Cooke's Plains	1·81	21·26	13·64	15·41
Coomandook	1·63	18·71	15·27	17·22
Coonalpyn	1·96	21·81	15·51	17·44
Tintinara	2·25	21·21	16·45	18·70
Keith	1·82	17·90	15·75	17·91
Bordertown	1·58	19·83	16·98	19·32
Wolseley	1·82	21·58	16·38	18·44
Frances	2·22	19·45	17·63	20·03
Naracoorte	2·20	23·37	20·11	22·62
Penola	2·09	23·24	23·22	26·14
Lucindale	2·83	27·67	20·85	23·11
Kingston	2·39	24·89	22·00	24·33
Robe	2·60	27·50	22·57	24·65
Beachport	1·99	32·33	24·72	27·01
Millicent	2·55	30·67	27·06	29·81
Kalangadoo	3·13	35.23	28·76	32·30
Mount Gambier	2·78	31·20	27·15	30·64

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Nov.	Dec.
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	*	11	9
Alma	*	—	—
Amyton	*	—	—
Angaston	*	—	—
Appila	*	—	—
Appila-Yarrowie	†	—	—
Arthurton	*	—	—
Ashbourne	†	9	7
Auburn Women's	†	25	R
Balaklava	*	R	R
Balhannah	†	—	—
Balumbah	†	—	—
Barmera	†	—	—
Beetaloo Valley	†	7	12
Belalie Women's	*	8	13
Belvidere	*	—	—
Berri	*	14	7
Big Swamp	*	—	—
Blackheath	†	17	15
Black Rock	*	—	—
Black Springs	†	8	R
Blackwood	†	14	12
Block E	*	—	—
Blyth	495	25	23
Booleroo Centre	*	11	9
Boolgun	*	—	—
Boor's Plains	501	3	R
Borrika	*	—	—
Bowhill	*	7	12
Brentwood	502	3	1
Brinkley	*	9	7
Brinkworth	*	7	12
Brownlow	496	—	—
Buchanan	†	—	—
Bugle	*	8	13
Bundaleer Springs	*	—	—
Bute	*	17	15
Butler	*	—	—
Calca	*	—	—
Cadell	*	—	—
Caliph	*	1	6
Caltowie	*	—	—
Canowie Belt	*	—	—
Caralue	*	9	7
Carrow	*	9	7
Chandada	*	—	—
Charra	*	—	—
Cherry Gardens	†	12	10
Clanfield	*	—	—
Clare Women's	†	—	—
Clarendon	*	7	12
Cleve	*	5	3
Cobdogla	*	—	—
Collie	*	2	7
Colton	*	—	—
Coomandook	*	24	29
Coonalpyn	*	—	—
Coonawarra	*	10	15
Coonawarra Women's	†	16	21
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	—	—
Cummins	*	11	9
Cungena	†	3	1
Currency Creek	515	14	12
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	—	—
Elbow Hill	†	8	13
Eudunda	*	7	5
Eurelia	*	12	10
Eurelia Women's	*	2	7
Everard East	*	—	—
Farrell's Flat	*	25	30
Finniss	*	—	—
Frances	†	—	—
Frayville	517	—	—
Gawler River	*	—	—
Georgetown	*	12	10
Geranium	510	26	31
Gladstone	†	11	9
Gladstone Women's	†	11	9
Glencoe	*	8	13
Glossop	*	—	—
Goode	*	16	18
Goode Women's	*	16	18
Greenock	†	—	—
Green Patch	502	10	8
Gulnare	*	—	—
Gumeracha	*	14	12
Halidon	*	—	—
Hanson	*	8	13
Hartley	*	9	7
Hawker	518	—	—
Hindmarsh Island	*	—	—
Hookina	*	—	—
Hope Forest	†	7	5
Hoyleton	*	21	19
Inman Valley	†	17	15
Ironbank	*	—	—
Jamestown	*	R	R
Jervois	†	10	8
Kalangadoo Women's	*	12	10
Kalangadoo	*	12	10
Kalyan	*	16	21
Kangarilla	†	—	—
Kangarilla Women's	†	17	15
Kanmantoo	*	—	—
Kanni	*	—	—
Kapinnie	†	11	—
Kapunda	*	11	9
Karcultaby	*	—	—
Karoonda	*	16	14
Keith	*	10	8
Kelly	*	12	10
Ki Ki	507	—	—
Kilkerran	*	10	8
Kongorong	*	7	12
Koolunga	*	—	—
Koonibba	*	10	8
Koonunga	*	—	—
Koppio	*	8	13
Kringin	*	14	12
Kulkawirra	†	8	13
Kyancutta	504	1	6
Kybybolite	*	10	8
Lameroo	512	12	10
Langhorne's Creek	†	9	7
Laura	*	12	10
Laura Bay	*	8	13
Lenswood and Forest Range	†	—	—
Light's Pass	497	—	—
Lipson	*	12	10
Lone Gum and Monash	*	9	7
Lone Pine	*	7	12
Longwood	†	—	—
Lowbank	*	9	7
Loxton	*	11	9
Lucindale	*	—	—
Lyndoch	†	8	13
McLaren Flat	†	—	—
McLaren Flat Women's	†	3	1
Macclesfield	†	17	15
MacGillivray	*	8	13
Mallala	*	21	19
Maltee	†	10	8
Mangalo	505	—	—
Mannanarie	*	—	—
Marama	†	—	—
Meadows	*	9	7

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.	
		Nov.	Dec.
Meribah	†	R	R
Milang	†	12	R
Millendilla	*	—	—
Millicent	*	25	30
Millicent Women's	487	—	—
Miltalie	†	12	R
Mindarie	*	4	2
Minnipa	*	—	—
Modbury	*	9	—
Monarto South	508	—	—
Moonta	*	—	—
Moorlands	*	—	14
Moorook	*	—	—
Morchard	†	11	R
Morphett Vale	*	—	—
Mount Barker	*	21	19
Mount Bryan	*	—	—
Mount Compass	†	3	1
Mount Gambier	†	11	9
Mount Hope	*	8	6
Mount Pleasant	*	—	—
Mount Remarkable	*	—	—
Mount Schank	*	—	—
Mudamuckla	*	12	10
Mundalla	494	—	—
Mundalla Women's	†	10	15
Murray Bridge	*	—	—
Murraytown	*	—	—
Mypolonga	*	17	15
Myponga	†	9	7
Myrla	*	10	8
Nantawarra	*	12	10
Naracoorte	*	—	—
Narridy	*	—	—
Narrung	†	—	—
Nelshaby	†	—	—
Nelshaby Women's	*	9	7
Netherton	509	—	—
New Residence	*	—	—
North Booborowie	*	10	8
Nunjikompita	*	9	7
Nunkeri	*	14	12
O'Loughlin	*	—	—
Orroroo	*	9	7
Overland Corner	510	11	9
Owen	*	—	—
Palabie	†	22	R
Parilla	*	16	21
Parilla Women's	*	14	12
Parilla Well	*	29	27
Parilla Well Women's	*	—	—
Parrakie	513	22	20
Parrakie Women's	487	R	R
Paruna	†	8	18
Paskeville	*	4	2
Pata	*	—	—
Penneshaw	*	5	3
Penola	†	—	R
Penola Women's	488	10	8
Penwortham	†	8	13
Petersville	*	26	24
Petina	*	—	—
Pinbong	†	—	—
Pinkawillinie	*	—	—
Pinnaroo	*	4	2
Pinnaroo Women's	†	19	R
Port Elliot	†	8	13
Pygery	†	—	—
Quorn	*	7	12
Ramco	†	—	—
Rapid Bay	*	—	—
Redhill	*	12	10
Rendelsham	†	—	—
Renmark	†	—	—
Rhynie	*	10	8
Richman's Creek	*	14	12
Riverton	*	—	—
Riverton Women's	*	—	—
Roberts and Verran	*	—	—
Rosedale	*	—	—
Roseworthy	*	—	—
Rosy Pine	*	—	—
Rudall	*	8	6
Saddleworth	*	11	16
Saddleworth Women's	†	1	6
Salisbury	*	—	—
Salt Creek	*	—	—
Sandalwood	*	—	—
Scott's Bottom	†	11	9
Shoal Bay	†	8	13
Smoky Bay	*	—	—
Snowtown	*	11	9
South Kilkerran	†	8	13
Spalding	*	—	—
Springton	†	2	7
Stanley Flat	†	21	R
Stirling	*	—	—
Stockport	†	—	—
Strathalbyn	*	—	—
Streaky Bay	*	25	23
Tailem Bend	*	17	15
Talia	*	25	30
Tantanoola	†	5	3
Tantanoola Women's	†	2	7
Taplan	†	8	6
Taragoro	†	10	8
Tarcowie	*	—	—
Tarlee	*	—	—
Tarpeena	*	—	—
Tatiara	*	—	—
Thrington	*	—	—
Tintinara	*	—	—
Truro	†	14	R
Tulkineara	*	10	15
Tweedvale	†	17	15
Two Wells	*	—	—
Ungarra	*	—	15
Upper Wakefield	†	R	R
Uraidla and Summertown	*	7	5
Veitch	*	—	—
Virginia	*	—	—
Waddikee Rocks	505	12	10
Waikerie	*	11	9
Wallala	*	9	14
Wanbi	*	23	28
Wandearah	*	8	13
Warcowie	†	8	R
Warcowie Women's	491	8	R
Warramboo	506	8	13
Warramboo Women's	*	R	R
Wasleys	497	10	8
Wasleys Women's	†	3	1
Watervale	*	21	19
Wauraltee	*	8	13
Weavers	†	14	12
Wepowie	†	—	12
White's River	*	8	13
Whyte-Yarcowie	*	—	—
Wilkawatt Women's	*	—	—
Williamstown Women's	†	2	7
Williamstown	*	—	—
Willowie	*	28	26
Wilmington	*	8	R
Windsor	*	—	—
Wirrabara	*	—	—
Wirrilla	498	10	R
Wirrilla Women's	*	3	1
Wirrulla	*	16	21
Wolseley	*	14	12
Wudinna	*	—	—
Wynarka	*	—	—
Yacka	*	—	—
Yadnarie	506	8	13
Yallunda Flat	*	—	—
Yandiah	*	R	R
Yaninee	*	—	—
Yantanabie	*	—	—
Yeelanna	*	9	7
Yorketown	†	—	—
Younghusband	*	—	—
Yurgo	†	—	—
Yurgo Women's	492	—	—

* No report received during the month of October. † Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

WOMEN'S BRANCHES.

MILLICENT (Average annual rainfall, 29.81in.).

July 15th.—Present: Nine members.

Recipes.—*Home Made Soap*—A tested recipe: Put 1lb. resin and ¼lb. borax in a copper with 11 pints of hot water. Boil until the resin is soft and stringy. Melt 6lbs. of fat (it must be free from salt) and pour into the copper, stir all together; dissolve 1lb. of caustic soda with 3 pints of warm water, use a large tin or enamel vessel for this purpose; while it is bubbling pour into the mixture in the copper, stirring all together. Add ½ a cup of liquid ammonia and half a packet of lux flakes. Boil for 5 minutes then pour into moulds or leave in the copper to set. Draw the fire if the soap is left in the copper. The soap is of a white color when first made. It should be cut into bars or pieces and left stand to dry for a month before using. It will then be of a pale yellow color (Mrs. W. Varcoe). *Melon Pickles*: 8lbs. of melon cut into squares, 4lbs. onions (cut up), 3lbs. sugar, ½ cup salt, 2 quarts of vinegar. Put 1 teaspoonful of cayenne pepper, 2 teaspoons pepper corns, and 2 teaspoons cloves into a muslin bag. Then put all on to boil. When they have boiled, mix together 2 tablespoons of mustard, 2 tablespoons of curry powder, and a little more than ½ cup of plain flour, with enough vinegar to make a smooth paste. Stir into the pickles and boil until melon and onions are quite tender. Stir occasionally while cooking. Bottle while hot and tie down when cold (Mrs. W. Varcoe). *Melon and Apricot Jam*: Cut 3lbs. melon into small squares and sprinkle with 2lbs. sugar, leave overnight, soak 1lb. dried apricots and leave till morning; add another 2lbs. sugar and boil all together for 3 or 4 hours, or until nice and thick. It will jelly on a saucer when done (Mrs. A. Bitschke). *Golden Gate Marmalade*: Take 12 oranges, 2 pints of cold water to each pound of fruit, ½lb. of sugar to each 1lb. of cooked fruit. Wash oranges, cut in halves, and squeeze out juice and pulp. Cut peel into shreds, weigh pulp, juice, and peel, place in preserving pan. Cover with the cold water and stand overnight. In the morning boil until the skin is tender, then weigh cooked mixture, add sugar, and boil for 40 minutes. Cool and pour into hot sterilised glasses and seal; keep in a cool, dark place (Mrs. H. W. Altschwager). (Secretary, Mrs. W. Varcoe.)

PARRAKIE (Average annual rainfall, 14.52in.).

May 26th.—Present: 12 members.

The Dairying Industry.—Mr. E. Fromen, of the S.A. Farmers' Union, in the course of an address first gave a short resume of conditions in other parts of the world and on marketing problems. The United States and Canada were in difficulties. Butterfat in both Canada and the United States during the past winter was down as low as 6d. to 6½d lb. and at present was 7d. to 7½d. lb. fat with a falling tendency. Pigs were 2½d. to 3d. lb., and eggs 6d. to 8d. dozen in the big cities. South Africa, which, like America, was on the gold standard, was just as badly off, and to save farmers from absolute ruination, the Government had arranged to pay a bonus of 6d. lb. on all export butter, and 6d. dozen on all export eggs. Without this bonus their prices would be down to 4d. to 5d. lb. for butter. In Denmark and the Baltic States, the value of butterfat was only about 7d. lb. Germany who at one time consumed 33 per cent. of the World's exportable surplus of butter, had by proclamation stopped imports and was only allowing small quotas to come in, and even when they were prepared to buy, they were putting difficulties in the way of buying, and wanted credit, consequently England was the only market for all the surplus butter from the Baltic States and from Holland, and the only place where the sellers could get cash; it was all pouring into Great Britain in spite of the 10 per cent. duty, and prices to-day were lower than what they were before the duty was imposed. So far as bacon was concerned, Denmark was shipping between 6,000 and 7,000 tons a week of bacon to

England; the other Baltic countries from 2,000 to 3,000 tons every week, and the prices in England ranged from 4d. lb. for Polish bacon to 5½d. and 6d. lb. for the finest Danish. Eggs were not quite so low, and prices had kept up better than butter or bacon. Under these circumstances, he could not hold out any bright prospects of big prices. Farmers must try to produce all the food for cows, pigs, and poultry on the farm and not buy anything outside of the farm, and if this were done, the whole of the returns from produce sold belonged to the producer. Anyone who kept cows and produced milk had the skim milk, which was a very valuable food for pigs or poultry. Skim milk, either fresh or sour given to the poultry helped to make a balanced ration and increased egg production. It should be used with care, and one should not give them fresh skim milk one day and sour skim milk another, that upset the birds. So far as pigs were concerned, there had not been any big expansion, and if the wheat farmers who kept cows studied pig production they would find that they would receive a bigger price for their wheat and barley in the growing of pigs than they received selling same at the railway. Approximately it could be taken as a calculation that every 1d. lb. for pigs represented 1s. bushel for wheat or barley; *i.e.*, at the present time bacon pigs were worth 5d. lb. at the factory. Allowing for the cost of railage, etc., ½d. lb., the wheat would realise equivalent to 4s. 6d. bushel on the farm, if fed properly and carefully to well-bred pigs. The export of pigs had not been very large; a few hundred thousand had been shipped home frozen in the form of porkers, but producers in Australia had not made use of the skim milk, and under proper conditions each farmer keeping cows should breed and sell at least three to four pigs a year for each cow that he kept. A very fine market had been built up in shipping eggs in the shell to England and last year 11,000,000 dozens were sent from Australia, of which South Australia contributed 1,900,000 dozens. The eggs shipped realised to the farmer from 10d. to 11d. dozen, which, taking into consideration the low price of wheat, was a very splendid return, but unfortunately the country egg producers did not share in these prices, and they only received from 4d. to 5d. dozen during the export season, while the professional poultry farmers and the farmers living in the hills surrounding Adelaide had the benefit of the higher prices. The reason for the low prices of country eggs was because they became too stale and had too big an air space before they reached the city, and were only fit to use for pulping purposes. Egg pulp for export could only be produced from cheap eggs, because they had to compete with the Chinese and other egg pulp that was being shipped in big quantities to England. By pulping eggs at those values they had been able to ship pulp from South Australia to England, and altogether some 600,000 dozen eggs had been shipped in the form of pulp. How to deliver the eggs in good condition and have a share in the high prices was what producers wanted to know. This could only be done if it were possible to collect eggs twice weekly from farm to farm, and if in the district within a distance of, say, 40 miles there were 16,000 laying hens arrangements could be made for collecting by motor lorry from the farm twice weekly. In a district with, say, 32 farmers who were running 500 hens each or 64 farmers with 250 fowls each a motor collection could be started. This would be a little expensive, but you would be repaid fourfold for the extra expense. The eggs would be delivered in Adelaide in a condition that most of them would be suitable for export. The motor lorry would also collect cream, and probably arrangements could be made to carry parcels and bring out anything wanted from the township. It must be understood that it would not pay to run a mile or a mile and a half off the road to a farm where only 50 or 100 fowls were running. He placed the number of fowls at the minimum of 250, and there must be at least 16,000 fowls producing on an average of 8 to 10 dozen eggs a year from each fowl to enable the cost of collecting eggs by motor lorry to be met on a reasonable basis. In addition to collecting the eggs, farmers would then have to use more care in looking after the eggs on the farm. The fowls must be provided with water, and if possible, green feed. Nests must be provided where the fowls could lay their eggs under clean conditions. Washed eggs were useless for export, and only clean eggs not washed would do for that purpose. The eggs should be collected on the farm twice a day and immediately put in the coolest place available. With this system there would be no difficulty in collecting and packing, and on the price obtained a bonus could be paid to the suppliers. Under this system there would be a big percentage that could be shipped to London. Probably when farmers realised the necessity for taking care of their eggs 70 or 80 per cent. would be suitable for export, and would fetch a good price. Unless some such scheme was brought about the eggs from the whole of the mallee districts would only be fit for pulping, and would fetch the lower prices. Mr. Shannon also addressed the meeting. (Secretary, Mrs. Cabot.)

PENOLA.

The Kitchen.—The following paper was read by Mrs. F. Kidman (Hon. Secretary) at a recent meeting of the Branch:—"The kitchen should be a bright and airy room, with enough space for the work that has to be carried out in it. The importance of a bright kitchen should be carefully considered when choosing a house, and special thought should be given to it. Sometimes an unavoidably dark kitchen can be made brighter by having the outside wall painted white, or a light color. Besides a cheerful aspect, there are several other points which must be attended to. Ventilation must be good, not only on account of those who have to work and live in it, but also for the benefit of the whole house. With a badly ventilated kitchen the fumes of cooking will spread to where they are not wanted. In addition to a door and a window, it is sometimes a good plan to have a ventilator put in the wall above the height of the window. To carry off the steam from cooking, whenever work is going on in the kitchen, the window should be a little open, even in winter. The sanitary arrangements must also have particular attention, and there must be a plentiful supply of water. As regards the position of the kitchen, it should be within easy reach of the dining room, and yet so placed that the odours of cooking do not penetrate to the other parts of the house. The pantry and store room should be near at hand to avoid unnecessary walking. The walls and ceiling of the kitchen—if plastered—can be whitewashed, or washed over with kalsomine or specially prepared paints, which can be had in a variety of shades. The woodwork in the kitchen should either be painted the same color or a darker shade. *The Flooring.*—This will be found to vary according to the locality—flags, tiles, red bricks, concrete, or wooden boards. Where the floor contains flags, tiles, or red bricks it needs no covering, because these are washed and a few rugs are all that are needed for standing on. With a wooden floor the boards soon become soiled and are difficult to keep in order. In this case it is better to cover them with some material that is easy to wash. Good, well-seasoned linoleum is the best covering for the floor, and one with a pattern is generally preferred, because it does not show the marks so readily as a plain one. *Fittings and Furnishings.*—The number of immovable fittings in a kitchen will vary considerably with the style of the house. They generally comprise dresser, shelves, cupboards, and towel rail, sink, and stove or range. The dresser is really a kitchen sideboard, and in most modern kitchens is fitted against the wall, and sometimes belongs to the house. If it has to be made to order, take careful measurement of the wall space available, and have it made to fit. The upper part is generally made with grooved shelves on which plates and dishes or the dinner service are generally kept, or the shelves may be used for jars with hooks along the edge on which utensils may be hung. It is advisable to have a few cupboards. These will be found very useful, because articles can be kept covered and protected from dust. Cupboard accommodation in the kitchen is most valuable, but, unfortunately, in many homes the supply is inadequate. It is advisable in a small kitchen to have a cupboard fitted upon the wall in which small store provisions may be kept. A recess or corner may be utilised for this purpose, and a carpenter can put a set of shelves with a door at a small cost. When time and labor are both precious, as much as possible should be kept under cover, in order to save continual dusting. If the kitchen is small, the most should be made of it by using the walls. Shelves are often a great convenience on the wall, but should only be erected the height that one can reach. High shelves in a kitchen are practically useless, and they are a harbor for dust. A strip of wood placed below a shelf with hangers attached will be useful for small utensils, such as gravy strainers, egg slice, &c. Do not drive nails into the wall. The sink should be fitted against the wall near a window at a convenient working height. The back of the sink, if not placed in a window, should be made of some material—such as tiles—which will not spoil with the splashing of water. A plate rack may be fitted alongside the sink, thus avoiding the drying of them. Then also there can be fitted a well-sloped grooved board, sloping towards the sink on which dishes can drain. In an ordinary kitchen there is very little movable furniture required, and it never should be fitted up with unnecessary articles; an important article being the table. This should be as large as is convenient to the room. Ample table room will considerably simplify kitchen work. It should be made of plain wood and a convenient height to work, and one that is steady on its legs. Preference should be given to a table with drawers. A piece of light linoleum or oilcloth may be put on table with the assistance of a few tacks, and will save a great deal of scrubbing. But care must be taken when oilcloth is used not to put anything hot on it. The arrangement of the kitchen window depends mostly on the style of the house. As a rule a short muslin curtain across the window is all that is required. A strong washing muslin is best. If the window is a large one, a pretty cotton casement cloth or linen will add very much to the appearance of the room. Woollen draperies must never form part of the furnishings, they hold the odours of cooking and are not healthy. *Kitchen Utensils.*—It is impossible to enumerate the number of utensils required in any house. This may be determined by the style of house and the accommodation there is for keeping things, the number in family and their requirements, and also upon funds at disposal. Whatever is bought should be good, and as simple in construction as possible. Well-made cooking utensils will last a life time, while an inferior class of goods is never cheap. A little extra outlay for goods will pay in the long run. Cheap tin goods rust and quickly rose shape, and thin enamel is always false economy. In most circumstances it is best to buy only just what is necessary to begin with, and gradually add to the supply as the occasion demands. It will generally be found that the better the cook the less utensils required. *Kettles.*—This generally depends on the kind of stove used. Block tin, wrought iron, copper, are all good and all are easily cleaned. Kettles that boil over are troublesome. One of the inventions in the kettle line is the whistling kettle, which gives a shrill whistle when the kettle has boiled and summons one to the spot. A good clock must not be forgotten when furnishing the kitchen—either one to hang on the wall or a good alarm. *Cleanliness of the Kitchen.*—These are two of the most prominent factors in the management of the kitchen. The old rule, "A place for everything and everything in its place," must be adhered to if order is to reign in this department, and it may be taken as a fact that if it does not reign in the kitchen it will not apply anywhere else in the house. It is very important that the kitchen be well arranged to start with, and that provisions and utensils, &c., be placed as near as possible to the place where they are to be used and handled. This saves unnecessary walking. Strength is often wasted in taking journeys which may be avoided. It requires some thought to arrange everything comfortably and conveniently, but with a little trouble this can generally be done, and the actual labor of cooking will be lightened to a considerable extent. No good work can be done in a muddle, and it is generally found that good cooks make less mess and use the fewest dishes. Where cooking is going on there must always be a cleaning up at the same time, for when the making of one dish is finished, everything for which there is no further use can be put away before another is started. Often a small washing up can be managed, and thus a big one at the end avoided. The kitchen and all that it contains must be kept scrupulously clean. This is imperative, both to health and comfort. Cleanliness is one of the attributes of a good cook. It ought, therefore, to form the ground work of all training, for without it there can be no good results where cooking is concerned. Not only must the kitchen have its weekly and daily cleaning, the utensils must also be kept in good order. 'You can judge a workman by his tools' cannot be better applied than to a cook, because no woman who has any pleasure in her profession would put up with an untidy kitchen or dirty utensils. The cleanliness of both should be her special pride and care. The cleaning of the kitchen can be accomplished in one day, or by degrees, as is found most convenient. If the kitchen is a very large one, the latter plan would be the better of the two, the work is the less obtrusive, and it does not upset the household so much as a big turnout would do. The stove and flue may be done one day, with the scrubbing of floors and tables to follow, the cupboards and windows another day, and so on. This is entirely a matter of arrangement, and must be planned to suit the ways of each individual household. The walls should be dusted. Tie a duster to the head of a broom. As a rule the kitchen requires a good scrubbing once a week, other days it must be swept over and washed as necessary. Linoleum should not be left wet. Windows—to clean these start at top and work down. Tables and cupboards—an effort should be made to keep these as white as possible; when cleaning a table do not forget the legs. *Saucepans.*—As soon as a saucepan is finished with it should be filled with water and left to soak until time of cleaning. Care should be taken not to pour cold water into hot enamelled saucepans, there is always a danger of cracking the enamel lining. Saucepans should be cleaned as soon as possible and only soaked overnight in special circumstances. The method of cleaning depends on the kind of saucepan. If iron or enamelled pans become burnt, boil with a little soda and water before cleaning. Soda must never be used with aluminium. New saucepans should be filled with cold water and brought to the boil before being used. *Cake tins* should be washed frequently. If they have been lined with paper, a good rub with a dry cloth or a piece of paper is all that is necessary. When they do require a washing, see that they are thoroughly dry before being laid away, they are very liable to rust. A very good plan is to put them on a rack above the stove or in the oven for a while. In fact all tin goods should be dry before putting away, also the mincing machine. After a pudding cloth has been used it should be thrown into hot water to which a little soda has been added. Let stand half hour and then rinse until no trace of soda water remains. Dry and put away until required for further use. A pudding cloth should only be used for its own special purpose. If the above process is not enough to clean it, it may then be boiled in a saucepan of water; the use of soap and soap powder being avoided. Pie dishes that have been stained and burnt in the oven may be cleaned with the use of a little salt. With regard to dish cloths, these are best made of some open material, such as thin old towelling, or cheap canvas-like material. Some people prefer a mop or dish brush, and both are useful. At the end of the day all kitchen cloths which have been used and soiled should be washed in soapy water with a little soda, rinsed, and hung up to dry. At the end of the week they should be laid aside to have a more thorough washing and boiling with the rest of the household linen, and a fresh supply put into use.''

WARCOWIE (Average annual rainfall, 11.42in.).

August 9th.—Present: 11 members and four visitors.

KEEPING CHILDREN EMPLOYED.—Mrs. A. F. Crossman read the following paper:—''Keeping children employed is a big problem at times, but what to get them interested in depends on the children themselves, what one likes another dislikes, and no two as a rule are just alike. The small child should be encouraged to make its own fun or amusement and not be running to mother with, 'What can I play with?' all the time, there should be quite a lot of interest in things outside for the average healthy child. Then for the little chap the handy man about the place can usually manufacture a cart with a coat of paint—it is usually hailed with joy. The child can be taught to bring mother a load of wood with this, and will think it fun until the novelty wears off, but with patience the child will, as he grows older, get into the habit of doing it and so in time be a little help. Then too, there are usually the cows to be brought in on most farms. If the cows are quiet and will not rush it does not hurt the older lad to do this providing they are within sight of the house or the child knows his way exceptionally well. They usually gain confidence to go further as they get older and most boys like doing things like that because dad does them. If children are able to attend a school they usually have their days full, and it need not worry mother what to give them to make the day pass happily. The little girls will often be very fond of dolls, and with one or two inexpensive ones and some pretty scraps of material be very busy indeed, and most enjoy joining in the boys' games as well. If girlie shows skill with dressing her dolls encourage her to make little dresses for them. A swing is also an inexpensive pleasure to both girls and boys, also a skipping rope for girls—they may wear their boots out but they will be healthy and happily employed.''

Mrs. G. Hilder read a paper on the same subject:—''Children, like adults, are quick to respond to suggestion. It is always wise to get their point of view as well as your own. When they ask questions, always try to explain as well as you can, as their minds are constantly developing. Give the children a pencil and paper; this helps to develop their brains and keep them occupied. At the table is one place where you can train them in their manners and in being polite, ask them to pass things to you, also to fold their feeders and serviettes. A very good present for children is a little wash tub and scrub-board, which can be bought for a few pence. On washing days give them a few tiny things to wash and make them do them properly. For a boy, a small wheelbarrow or a little watering can is useful. Bringing in the wood, gathering eggs, feeding the fowls, and little odd jobs about the home keep the children employed as well as helping mother. Always praise children for helping, although you may have to do it again. Do not let them see you doing it as they are very easily hurt and will not be so eager to help again. Children's temperaments differ. What one child will do quite easily another needs a little persuasion.''

PROGRESS

If you contemplate the future, as we all can and do, you must gather some conception of the enormous progress that civilisation will inevitably make within the probable period of your life.

You must realise, too, that such progress will be the sum total of all individual endeavours. Thus you will realise, no doubt have already accepted, your own part in this great forward movement, which is progress. If you are to play your part valuably you must not be a drag upon any other section of the community, but, in one respect at least, you can provide against this.

The Savings Account will help you build your career, help you to independence, and therefore to a useful place as a citizen. Very little money is required to start an account, which will cost you only the decision to open it, and to faithfully maintain it for your own, and, therefore, for the general national welfare.

Commonwealth Savings Bank of Australia

GUARANTEED BY THE COMMONWEALTH GOVERNMENT.

The same subject was dealt with by Mrs. A. Avery in the following paper:—"It is rather a difficult thing on the farms in the early stages of our children's life to find sufficient occupation of various kinds to keep our children employed without the employment being made too monotonous, so by the time the child has left school it is sick of the farm and all it contains. Children in the towns have so many more advantages than those on the farms, and parents should do all in their power to make farm life more attractive and less of the drudgery that it can be if no interest is taken in any other outside life. This also tends to make the views of our children narrow and one-sided. There are many jobs our children can do from the earliest of their lives that help mother and also help to keep their minds occupied and fill in their time; such as keeping the wood and chip box supplied for lighting the fire in the morning. This task should not be made an over-burdened one, as the small child should not be allowed to carry too heavy pieces of wood or drag heavy loads, nor carry the chip box too full and heavy. Then there are the eggs to be gathered. Teach the child to count as soon as it is old enough and then it can tell you how many eggs have been gathered. Then there are generally pets of various kinds on the farm. Give to the child one of these to care for and feed; this teaches them to love and look after the animals and to learn that animals require looking after the same as human beings. There is nothing more cruel to me than to see an animal or bird that is not properly cared for and looked after, especially when they are shut in cages or tied up. As the children grow older, watch closely for whatever occupation they develop a greater liking for in the various occupations that are given to them, and when old enough to do so, give the child a trial of that occupation and then the proceeds from such, if there are any, can be banked and used when needed for something else. Give the child a broody hen to set and look after. When the chicks are hatched teach them how to feed and rear the chicks and give to them some of the chicks they rear for themselves. These they may dispose of or keep for further profitable uses, but if done this way it will encourage them to try again, and when there are any returns these can either be used for enlarging the number of poultry or placed by for some other good use. If they have a tendency for a garden give them a corner and let them have a try with a few flowers and then give them some vegetable seeds. If these are a success let them sell some and with the proceeds buy some more seeds and try a larger plot. I do think the children on the farms to-day are given sufficient encouragement to carry on; too often the parents err by taking all the proceeds after the child has helped in a fairly large way to make the returns more profitable. If the children help milk the cows, give them either a calf, from which the proceeds should be banked for them until required, or give them some return from the cream cheques or butter that is sold. This subject deals with various occupations of the farm, but there are times when our children have not any liking for the farm or any of its occupations, then I would strongly urge that the parents endeavor to educate the children to the best advantage for the occupation they mostly develop a greater liking for, pointing out to the child that when it is old enough and sufficiently educated to earn a salary of its own, it should endeavor to return a small amount to its parents if it is needed for the help that was given it when it was not able to do for itself. Let the children join in the sports of the district and give them all the advantages of learning to do things, whether it be sport or work. Do not indulge in either to excess—work can be made too much a drudgery very easily and sports become very monotonous if overdone. Above all, in whatever tasks you undertake, teach the children to do it with a will and it will be done thoroughly." (Secretary, Mrs. A. Crossman.)

YURGO.

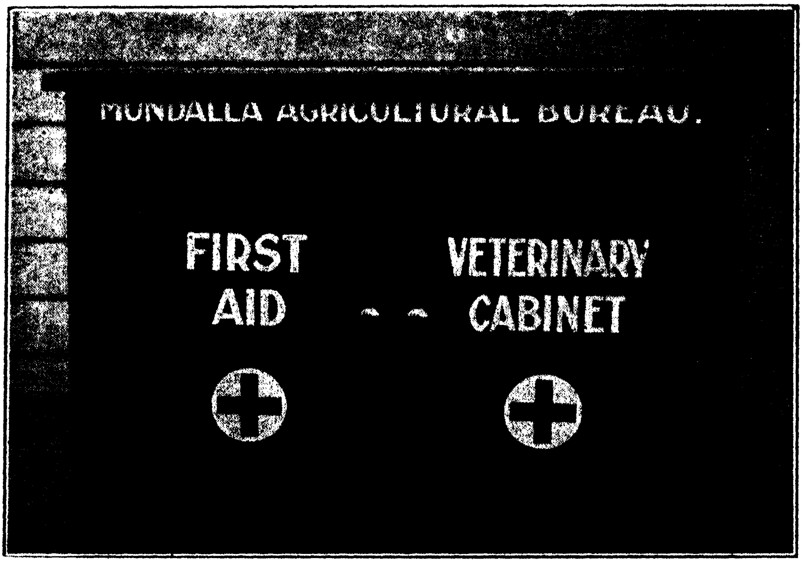
July 18th.

GARDENING.—The meeting was held at the residence of Mrs. Jarrett, who read the following paper:—"To make the garden a success a good fence which is fowl and pig proof is most necessary. If the men on the farm realised the comfort and happiness the women folk derived from a garden with its bright flowers and vegetables, the work of putting up a strong fence would not be a serious consideration. Nothing gives the home a brighter and more home-like air than a good garden. All vacant ground should be dug up and well limed and left in its rough state for a week. Then apply and dig in a good dressing of well rotted stable manure. All weeds must be kept down. They are great robbers of the soil, check the seedlings, and use up the moisture, and keep the sunlight from around the plants. Always hoe after watering, do not allow the soil to set firmly, it will crack and allow moisture to escape. The winter garden does best in most parts of the Mallee. Sow vegetable seeds in January and plant out seedlings as soon as big enough. It is most important to have the ground well prepared before planting out seedlings. See that plenty of rotted manure has been added and the soil brought to a fine tilth. Watch the seedlings carefully. It is not necessary to have large seedlings, but they should be strong plants. Use liquid manure to force them on, but see that the soil is damp before it is applied. Lettuce must be grown quickly to be a success. Use plenty of liquid manure and never allow the soil to dry out. In fact, all vegetables are the better for having been quickly grown. Do not overcrowd the plants, the sun should always be able to shine between the plants and care should be taken about the rotation of crops. Beans are usually difficult to grow, but if "Climbing Epicure" is sown in September and properly looked after success will be assured. Plant behind a broom brush fence away from the north winds, then when the plants have the beans ready to set, start watering with sulphate of ammonia every three weeks, using three dessertspoonsful to a petrol tin of water. Well water the plants, taking care not to wet the foliage with bore water. Onions do exceedingly well in the sand, and if pulled correctly can be hung and kept for months. Beans and peas are two of the best nourishing vegetables and can be grown. Spinach is easily grown and should be given to children. Carrots, grated, make a delicious sandwich for school children. Maize makes a good break-wind, but allowance must be made for its roots if other crops are planted near it. It makes good cutting for green feed for poultry, the cobs are very sweet and can be used in the home. The dolichos makes a splendid break-wind. As to flowers, this depends on how much time and room one has. However small or plain a home may be, some flowers give it a touch of refinement. Bulbs grow well in the sand, and if some are planted in pots or tins, they can be lifted while flowering. The same applies to many other plants. Carnations are easily grown, but they do not last very long on bore water. However, they can be kept going by striking fresh slips every year. Lantanas make a wonderful show and are quick and strong growers. A good plan is to get tree seeds of all kinds and raise trees for beautifying the homestead. Almond trees are both pretty and ornamental, the almonds being exceptionally useful. Sunflowers grow easily and will give the place a touch of brightness, and the seeds are useful for poultry and birds. Gardening has many bright sides, and if country folks only realised the joy of it they would try even if their time is limited." (Secretary, R. Sanders.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Warramboo ...	15/7/32	—	" Gardening," Mrs. W. Norris	Mrs. A. Collins
Parilla	21/7/32	—	Formal	Mrs. R. Welden
Parilla	17/8/32	—	Annual Meeting	Mrs. R. Welden
Penola	17/8/32	160	Annual Social	Mrs. F. Kidman
McLaren Flat .	24/8/32	22	Address—Miss E. Campbell	Mrs. H. Robertson
Belalie	1/9/32	22	Address—Miss E. Campbell	Mrs. A. Cummings, Jamestown
Eurelia	27/8/32	9	" Rug Making," Mrs. Wall	Mrs. I. Wall
Belalie	27/9/32	19	Congress Reports	Mrs. A. Cummings
Parrakie.......	27/9/32	11	Annual Meeting—Congress Reports	Mrs. White
Pinnaroo	2/9/32	18	" Woollen Comforts," Mrs. Seidel	Mrs. F. Atze
Auburn	30/9/32	22	Congress Reports	Miss L. Dennison
Mangalo	29/9/32	8	Congress Reports	Mrs. F. Coles
Saddleworth ...	2/9/32	5	Homestead Meeting	Miss G. Frost
Saddleworth ...	4/10/32	7	Congress Reports	Miss G. Frost
Clare..........	1/10/32	25	" Gardening," J. Ashby .	Mrs. H. Rogers
Wasleys	29/9/32	50	Annual Meeting	Miss G. George
Mundalla	17/10/32	18	Address—F. C. Richards	Miss K. Hillier
Gladstone	14/10/32	23	Congress Report	Miss M. Sargent
Tantanoola	5/10/32	13	Congress Report	Mrs. E. Telfer
Warcowie	4/10/32	10	Annual Social	Mrs. A. Crossman
Williamstown .	5/10/32	9	Congress Report	Mrs. A. Cundy
Penola	5/10/32	15	Congress Report	Mrs. F. Kidman

SOUTH-EASTERN.


MUNDALLA AGRICULTURAL BUREAU.
FIRST AID -- VETERINARY CABINET

The illustration above shows the First-Aid Veterinary Cabinet declared open for use by Mr. F. C. Richards (Assistant Secretary of the Advisory Board) at the Annual Meeting of the Mundalla Branch of the Agricultural Bureau. Mr. W. T. Herring made the cabinet without charge from timber donated by the Secretary of the Branch (Mr. H. Ross), in whose care it will be placed. In consultation with officers of the Stock and Brands Department and Mr. R. Wiese, of Mundalla, an excellent assortment of first-aid veterinary medicines and drugs was purchased by subscriptions from members of the Branch. The chest also contains various instruments, and these will be added to from time to time. It is proposed to allow members of the Branch to purchase the medicines at wholesale rates. The foundation of this chest is an excellent idea and one which should commend itself to other Branches of the Bureau.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Tantanoola	2/7/32	8	"Growing Early Potatoes," M. Telfer	H. Kennedy
Millicent	12/8/32	13	"Horses *v.* Tractor," G. Magor	E. Mitchell
Wolseley	9/5/32	13	"Care of Horses and Harness," J. Makin	E. Sharrad
Frances	6/7/32	—	Annual Meeting	E. Pfitzner
Tantanoola	1/10/32	12	Congress Reports	H. Kennedy
Mundalla	6/10/32	16	Congress Reports	A. Ross
Rendelsham	8/10/32	10	Congress Reports	F. White
Frances	5/10/32	—	Formal	E. Pfitzner
Mundalla	13/10/32	All members	Annual Social	A. Ross

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Wirrabara	5/5/32	9	Discussion	F. Borgas
Wirrabara	2/6/32	8	" Utilising Bones," Mr. Banfield	F. Borgas
Murraytown	24/9/32	9	Congress Reports	E. Pitman
Morchard	23/9/32	10	Congress Reports	A. McCallum
Warcowie	4/10/32	70	Annual Social	A. Crossman
Wepowie	5/9/32	12	" Tools on the Farm," J. Jasper	E. Roocke
Wepowie	27/9/32	15	Debate with Willowie	E. Roocke
Wepowie	10/10/32	17	Congress Reports	E. Roocke

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16.76in.).
July 22nd.—Present: 12 members.

Pig Raising on the Farm.—Mr. W. O. Eime read the following paper:—"If a farmer intends going in for pigs to any great extent, it pays to breed suckers, to buy them means that one cannot always get just the desired breed, and at times the price is too high. Suckers are not always as cheap as at present. I favor the Tamworth or Large White York sow crossed with a Berkshire boar, the main point is to get a good sow which will produce large litters, nothing under seven should do. If a sow produces less than seven, fatten and send her to market. A good cross, which I have found the most economical pig to rear and easiest to fatten, is the Gloucester Old Spot crossed with a Berkshire and that sow put back to a Berkshire. I have known pigs of this cross to dress 140lbs. at four months old. Generally speaking, the right class of pig should net the farmer £2 when five months old. *Feeding.*—A sow with a litter should receive a gallon of crushed corn with a little linseed and crushed oats, and about 1gall. of skim milk three times a day. This ration should be increased if the litter is very large and as the pigs grow. Most young pigs will start to eat when about four weeks old. The Large White I have noticed eat younger than any other, and the Berkshire is about the slowest at starting to eat. Wean when the pigs are about eight weeks, and wean gradually. Shut them away from their mother during the day and leave them together overnight for a few days, then for about two weeks give them crushed grain and skim milk, and after that put them with the other pigs on the self feeder, plenty of skim milk, and crushed wheat and as much green grass or lucerne as they care for. Crushed malt barley is very good, but wheat is without doubt the best fattening feed. I favor small paddocks and letting them graze. Dry sows do quite well on pasture; charcoal and a little ashes is good for them, also a little phosphate. It is necessary for them to have a little mineral each day. A good lick is 6 parts salt, 1 sulphur, 4 charcoal, 1 Epsom salts, 8 superphosphate. The chief trouble is that they do not only lick at this mixture, but they eat it, and it keeps one busy mixing it. The yards and sty should be well protected from the cold winds, and I favor a fair sized run with a good straw stall for shelter, where they can sleep on the sunny side sheltered from the wind. A young pig that has a serious setback will never pay to fatten, and my advice is to sell it. The best size to market pigs is when they will dress from 120lbs. to 150lbs. The man that has the right article will always get a reasonable price. More is paid per pound for baconers than any other class of pig, and a pig dressing 150lbs. of the Tamworth-Berkshire cross is ideal for bacon or ham. If a farmer does not favor crossbreeds, stick to the Berkshire, that is the only pig worth while of all the pure breeds. I am just trying a Large White York-Berkshire cross, and as far as growing quickly it seems as good as any other, but one must not lose sight of the Tamworth, which is a hardy mother and does not mind the heat or cold, and they are without doubt the best for foraging for their food. The farmer who milks a few cows should rear a few pigs every year." **(Secretary, L. Mugge.)**

splendid milk-producers and do not affect the flavor of the butter. Most farmers neglect growing Cape barley for the benefit of their cows; it is a better milk producer, and is much preferred by the cattle to malting barley . When hand-feeding, give oaten chaff with bran and crushed oats, adding a handful of bonemeal once a day. A box of equal parts of salt and super or bonemeal should be placed where it is accessible to all cattle. This is a most important factor in keeping the cows healthy. If possible water should be in every paddock where cows are pasturing. This is not only of great benefit to the cows, but is a great save to the farmer. On winter nights cows should have the benefit of a straw stack for shelter. The cow is a nervous animal and the strain of producing milk twice daily for perhaps 10 or 11 months of the year is a big drain on her system. Therefore every care should be taken in handling, feeding, and milking of the cows. For a fair sized herd I favor de-horning. This is best done when the calf is a few days old, by rubbing caustic potash on the horn buttons. Dehorned cattle are much quiter and more contented and are not harassed by one another, therefore they have a better chance of producing more. If all bulls were de-horned it would save dozens of accidents and possibly many lives. A few emergency medicines should be kept in case of sickness. One lb. Epsom salts, treacle 1lb., and ginger 2ozs., is a good drench for impaction or stoppage. For retention of afterbirth give two pints strong coffee with 1lb. Epsom salts, adding 1oz. sulphur. A few homoeopathic medicines are often handy, especially powdered nux vomica. Always keep a milk fever outfit on the farm, heavy milkers are apt to go down with this complaint. Inflation of the udder is the only treatment for this malady; take care and sterilize the needle and smear with vaseline before use. For mammitis apply hot fomentations to the affected quarter, then rub with warm camphorated oil. In the case of cows having pox on the teats, use turps 2 parts, olive oil 1 part. This can also be used for cut teats. A farmer who has good milking sheds where all cows can be fed in mangers and can be milked where they feed has a big advantage over those who bail each cow separately as it is milked. The floor of the shed should be bricked. These improvements are not only a great convenience, but a save in time. Exports of butter this season showed an increase of 2,150 tons, being 188 per cent. greater than the previous year. As regards decreasing costs of production, most farmers have been compelled to cut down expenses as much as possible, and the factories should try their utmost to decrease the charge of manufacturing. Even one farthing a pound reduction would mean over £12,000 more for the dairy farmers of this State. Producers should use every effort to keep the cream at choicest quality all the year round; that would help manufacturers because it would reduce the need for special treatment of lower grade creams. I favor a 50-test for the cream, because it is much easier to keep it in good condition. Always send the cream twice weekly to the factory, and if possible three times a week in summer.''

In addressing the meeting on ''Recreation on the Farm,'' Mr. Roberts stated that many men considered sport was unnecessary on a farm, and if indulged in, the farm could not be worked properly. He maintained that the crop yields of farmers who took part in sport in the district were equal to, if not greater than, the farmers who worked on their farms every day of the week. He considered sport should not be indulged in during the busy times such as seeding and harvest, but during fallowing recreation could be indulged in by both the male and female with advantage if they chose a good class of sport. It taught persons to take defeat in the right spirit and also to recognise a feeling of goodwill and fellowship among those with whom he or she came into contact. The social side of the question could not be over-estimated. Persons kept fit by sport were able to work ably, and were hale and hearty in old age. It also served as a character builder, which always helped a person through life. Sport was necessary on a farm, and in times of financial depression, &c., helped one to forget worries and to look at the bright side of life. In discussion, Mr. V. K. Oliver stated that since taking part in sport the half-day loss was not noticed; it assisted one to work enthusiastically. (Secretary, C. Currie.)

WIRRILLA.

May 15th.—Present: 16 members.

Care and Maintenance of Tractors.—Mr. A. Woods read the following paper:—''The tractor will respond to the treatment it receives just as surely as the horse, only in this mechanical power unit the results of care or abuse are more immediately noticeable, and the effects are more serious. The proper treatment of tractors is, therefore, essential to their long life, reliability, and to their economical service. On starting up the engine should be run on motor spirit until it is thoroughly warm before changing over to kerosene, and during the actual working the water in the radiator should be near boiling point—too much heat appears to cause a loss of power. The too early change over from petrol to kerosene tends to give crankcase dilution, and the running of an engine too cold does not allow the kerosene to vaporise sufficiently and give its fuel economical power. Since petrol is more expensive than kerosene, every effort should be made to warm the tractor on starting quickly by covering the radiator, this should also be done when running on light loads or in very cold weather to maintain the temperature of the water and help to reduce crankcase dilution. *The Air Cleaner.*—If the air filter is not kept in good condition particles of dust will enter through it into the mixture and into the cylinders, acting as an abrasive and causing rapid wear of the piston, rings, and cylinder walls, making rebores much oftener. Particles of dust also assist in the formation of carbon. Dirty filters also restrict the inlet of air and tend to give too rich a mixture. *Draining Crankcase.*—Since the oil in the crankcase must carry out so many duties, it is essential that this should be of high quality and kept in good condition. Owing to dilution and gradual accumulation of foreign substances, such as grit, the crankcase oil requires changing from time to time. The period between changes should not exceed 50 hours on kerosene and 100 hours on petrol—shorter hours would be beneficial to the life of the cylinder block and piston rings. Always keep the level of the crankcase oil well up, but do not overfill. When draining the crankcase kerosene should never be used for flushing purposes, as this may be caught in the pockets of the casting and pre-dilute the oil. The crankcase should only be drained when the engine and oil are thoroughly warm, because at that time the oil is well stirred up and will flow freely, thus allowing all the particles of foreign matter to flow out with the oil before they have time to settle at the bottom of the crankcase. The chief foreign substances that enter the crankcase oil are five in number—kerosene, dust, water, carbon, and steel, even with the protection of air cleaners and filters, the velocity of the inrushing air is so high that some of these particles of dust find their way into the engine. Once inside the engine it quickly mixes with the oil and accumulates on the cylinder heads and around the valves. This abrasive dust, mixed with oil, cuts much faster than would the dry dust that floats in the air around the engine. The air breathed in by an engine has a certain percentage of moisture, more so, of course, in damp climates than in dry. For each pound of kerosene burned there is about a pound of steam formed. If the crankcase is not warm some of this steam vapor will condense, forming water. Analysis of used crankcase oil often shows that it contains as much as 40 per cent. water. If you hold a glass tumbler over the exhaust pipe you will notice a rapid collection of water drops from the exhaust, so that it is essential to keep the engine at the right temperature, and frequently drain the crankcase. Do not neglect this important job if long life and low repair bills from the tractor are desired. A recent laboratory analysis of an oil after only 10 hours of operation showed that the lubricant contained 20.2 per cent. kerosene and 3.4 per cent. foreign matter. Such a diluted, dirty oil soon brings engine trouble and costly repairs. *Points to be Observed.*—(1) Change oil frequently, not over 50 hours on kerosene and 90 to 100 hours on petrol. (2) Drain crankcase when engine is hot. (3) Use correct grade of oil always, and keep to proper level. (4) Clean oil screen every six months. (5) Keep oil and air purifying devices clean. (6) Replenish oil frequently and in small quantities rather than large. (7) Avoid rich mixture adjustments of carburettor. (8) Keep ignition system in order; its efficiency affects dilution. (1) Do not drain crankcase when it is cold. (2) Do not flush with kerosene. (4) Do not overfill, excess of oil causes dirty plugs and increases consumption. (4) Do not continue to operate the engine when it continues to misfire, it may be a broken valve, and much damage will result. (5) Do not idle engine unnecessarily. (6) Do not race the engine, especially when starting up cold. (7) Do not use heavier oils because engine is warm, oil will never take the place of metal. (8) Do not forget oil is cheaper than repairs. (9) Do not forget to grease wheels and rollers, stearing gear, &c., at least once a day on caterpillar tractor, and use only heavy body oil, such as transmission oil. They were never made for grease; a very heavy oil is needed in harvest time. (10) Use only fresh, clean rainwater in the radiator, it is not advisable to use dam, well, or creek water if possible, but when this cannot be helped the radiator should be drained every few days with soda to clear out the sediment which collects in the tubes and water jackets of the cylinder block and may cause over-heating. (11) Always cover up the tractor at night, this will make for easier starting on cold, damp mornings, and also preserve the paint. A tractor four years old, which has always been covered up when idle in the paddock and at night, will look as new as one two years old which has never had a cover on it at night. Tractors are very useful pieces of machinery, and they have come to stay, but they cost money and cannot be bred like horses, so if given fair treatment they will give good results. Treat them as you would a team of £50 horses and they will not fail, and will do the work in half the time, and 24 hours a day if we want them to.''

Care of Horses.—The following paper was read by Mr. A. Evans:—''When bringing horses in from the stubble to prepare for seeding, do not give them a big feed and expect them to go into hard work. Bring them on to the feed gradually.

links made of ⅜in. iron about 3in. to 4in. long are very handy if working on rough ground. Should a bridle chain of the plough or cultivator break, it can be repaired in a few minutes. With the saw and hammer many carpentering jobs can be done to the sheds. (Secretary, S. Chynoweth.)

BRENTWOOD (Average annual rainfall, 15.54in.).

August 4th.—Present: 16 members and four visitors.

POULTRY AS A SIDELINE.—Mr. L. Darby read the following paper:—"The three chief sidelines on the average farm are sheep, cows, and pigs, but poultry can be made quite as profitable as any of these, providing the right breeds are kept and they are given proper attention. The breeds I would suggest keeping are White Leghorns, Black Orpingtons, and the new Dutch breeds, Welsummers and Barnevelders, are worth giving a trial. They are good layers of a large egg and are also splendid table birds, non-sitters, very hardy, and easy to rear. The average farmer should keep at least 150 laying hens. The houses are the first things to consider; these should be dry and free from draughts. All poultry should be locked up at night, and then there will be no trouble with foxes, and do away with the nuisance of them roosting on implements, etc. I advise feeding mash in the morning with grain at night, and green feed and meat meal with plenty of clean water and shellgrit always before the birds. The green feed is our biggest problem during summer. If it is possible to grow a patch of lucerne, the egg yield will be increased. The best time to hatch chickens is from August until October. If hatched during these months, the pullets should be laying when eggs are dearest. The incubator is the best for hatching. The chickens can be given to broody hens if they are available; if not, a very simple brooder can be made for very little cost and heated by an ordinary lantern. The cockerels should be separated from the pullets as soon as they can be picked, penned up, and fattened ready for market. It is a good plan to mate some of the best second year hens with a cockerel of a good laying strain. Eggs weighing under 2ozs. should not be hatched from. Hatch only from the 2oz. egg and larger and it will be possible to breed up a flock of hens that will lay a larger egg. All hens should be passed out at the end of the third year: after that the average hen does not pay for its keep. The poultry houses should be cleaned out frequently and the floors dusted with lime to keep down disease. A little Condy's crystals should be added to the drinking water. Roosts should be oiled regularly to keep down tick, red mite, and scaly leg parasites. Old car or tractor oil mixed with kerosene is good for this. All eggs should be kept infertile except those used for hatching, thus helping to establish a better export trade, which is so essential to Australia. All eggs should be kept clean, gathered daily, and marketed as early as possible. Ducks will lay more eggs than fowls, but I would not advise going in for them in large numbers. A few geese and turkeys may also prove profitable to sell at Christmas. With grain at a very low price as it is now, poultry can be made quite a profitable sideline, even if eggs are a low price. (Secretary, E. Carmichael.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Kilkerran	19/7/32	—	"Sport in Relation to the Farm," A. Sawade	E. Koch
Boor's Plains ..	30/7/32	300	Annual Social	S. Chynoweth
Arthurton	7/8/32	14	Paper—Hon. Sec.	T. Howlett, Moonta
Boor's Plains ..	8/9/32	—	Address—C. Goddard ...	S. Chynoweth
Sth. Kilkerran .	20/9/32	10	Homestead Meeting	R. Hasting
Paskeville	20/9/32	14	Congress Reports	J. Prouse
Weavers	5/9/32	8	"How to make Farming Pay," F. Anderson	H. Cornish, Stansbury
Yorketown	9/8/32	7	Discussion	C. Stead, Coobowie
Weavers	10/10/32	8	Congress Report	H. Cornish

WESTERN DISTRICT.

GREEN PATCH (Average annual rainfall, 26.56in.).

August 11th.

Mr. A. T. Cowley read the following paper on "Fallowing":—"From time immemorial ploughing has constituted the foundation of all working of land intended for the growing of cultivated crops, nor have the methods employed in ploughing varied greatly, so far as we can learn, until quite recent years, when modern methods and modern implements have resulted in a great variety of ways in which land may be worked or cultivated, with ploughing or breaking up and turning over of the surface to the desired depth, as the commencement of each period or cycle of working. By fallowing or breaking up the ground in winter or spring prior to the season in which it is to be sown we allow time for a great variety of workings and treatment of the land between ploughing and sowing, varying in different districts according to the nature of the land and climatic conditions. The purposes of fallowing common to all districts may be said briefly to be to rest the land from continuous growing of crops (a principle found as far back in history as the law of Moses), to eradicate weeds, and to allow time for treatment calculated to improve the conditions and fertility of the soil. Naturally we expect to harvest a more profitable crop from land that has been fallowed than from land not so treated. In calculating our profit we must, therefore, consider the cost of fallowing, and perhaps there has never been a time when it was more necessary than at the present to calculate as accurately as possible the cost or what we shall lose by fallowing, and the advantages, or what we shall gain by it. If we were to go no further in our calculations than the two years involved in growing a crop on fallow, we should be forced to the conclusion that under present conditions fallowing could not be made to pay. In other words we cannot follow a two-year rotation of fallow and wheat, or any other cereal which we may grow. On the other hand, we shall have to consider how long a period of rotation of cropping and grazing we can follow before we shall be at a loss by not leaving the land idle, or under fallow for one season. Upon the correct calculation of length and use of the rotation period, following upon the correct working and treatment of the land during the fallowing and cropping period, will depend our ability to gain the greatest profit possible from the land, under the varying conditions over which we have no control. The chief of these factors being weather conditions, and the market values of our various products, whether in the form of crops or livestock or their various by-products or sidelines. However, the purpose of this paper is not to deal with crop rotation or other uses of the land, but in view of all possible uses in conjunction with cereal growing we shall conclude that at least a portion of our land should lie out to fallow each year. I shall endeavor to deal briefly in a general way with some of the essential points to be taken into consideration in fallowing. Beginning with the initial breaking up of the ground we may consider the time of the year when this can most profitably be done. Whether we plough as early as possible, before weeds get a strong start and at the same time allow ourselves the longest possible period for subsequent cultivation, or whether we can more profitably run sheep on the land intended to be fallowed until late in the winter or early spring, thus allowing the sheep paddocks proper to become well grassed and so increase our sheep-carrying capacity, and still allow time to work the fallow fairly effectively, and without too seriously discounting the value of the subsequent crop. When a large area has to be fallowed and it is desirable to get all the land broken up early, it is possible under certain conditions to resort to the practice of summer fallowing, when the land can be broken up before seeding, following a summer rain. This is usually done without ploughing, and in this respect is an exception to the rule which, however, cannot be repeated—that is to say, it can be done only on land which has been ploughed in the preceding working. It is usually done with a spring tine cultivator which can be run over a large area quickly after rain, thus covering several times as much ground as could be ploughed while the moisture lasted, and by forming a mulch retaining the moisture long enough to enable another working to be given immediately with the same implement. This double working, under certain conditions being practically equal to later ploughing, allows of subsequent workings being given similarly to those employed on the later ploughed fallow. Winter fallow may be ploughed deep or shallow with pointed or plate share, or disc, according to requirements. Also "early" or "late." Under the latter headings it is generally understood that the earlier the ploughing the greater the depth. Other considerations also govern depth. Land described as heavy may be ploughed to a depth of 4½in. or more while light land is usually broken to a depth of less than 4in., and often less than 3in. Reverting to the question of time, it is generally understood that early ploughed fallow—commencing, say, about the middle of June in most districts, gives the best crop results, while a later start with the plough may give some advantages in the form of extra sheep feed, as already indicated. Subsequent working of fallow is calculated to serve various purposes. It may serve to improve the texture of the soil, to consolidate the subsoil, to aerate and sweeten the surface, control the moisture content within certain limits—that is, in a too-wet soil condition the working should be done with a view to the prevention of water logging, while in the greater part of the farming land of the State the object is to retain all possible moisture by keeping the bottom fine and closely packed while the surface is kept fairly rough and loose to form a mulch and retard evaporation, and at the same time to lessen the danger of drift to which some of these areas are liable if finely worked on the surface. A second reason for working of fallow is the destruction of all weed growth. Sheep should be used in conjunction with proper implements to assist in fulfilling both of these purposes, and also, in summer, if weeds persist in starting owing to the moisture retained through spring cultivation, or from a summer rain the sheep themselves will benefit greatly by the nibble of green thus provided when all other feed is dry. To go further into the question of the working of the fallow we may profit by discussing the work of some of the principal implements to be used. The plough may be required to have a pointed share for heavy or tough land, while a plate share is generally favored for light or medium soil. In either case mould-boards are required to be of such size and design as to completely turn and pack the soil. Too little attention is given to the latter requirement, as failure to place the turned soil firmly on the bottom to prevent the formation of cavities or air pockets, leaves a condition encouraging to the development of ''take-all'' in the subsequent crop. I regard the disc plough as an implement for use under special conditions only. I cannot speak from experience of possible uses for this implement in heavy land. In light soils the main uses are found in its ability to pass through, and effectively cut up, shrubs or rubbish that would choke another plough. In newly-cleared scrub land it is particularly efficient, not only in cutting through mallee or broom shoots, but also in shearing them off the stump and materially assisting in this ultimate destruction. Also in chopping up small tree roots lying near the surface where these are sufficiently numerous to be troublesome to any share or tine implement. For ploughing under ordinary conditions, I do not consider that the disc can compete with the share and mould-board plough. For subsequent working of fallow, if ''turning back'' with a light skim plough is favored, the depth should be considerably shallower than the original ploughing, the purpose of all workings being to consolidate the bottom layer of whatever has been turned under from the old surface, and to keep open to sun and air, and prevent packing or caking of what has been turned up to the surface to ultimately form the tilth for a perfect seed-bed. The main advantage of the skim-plough is found in dealing with weeds of such a nature as will persist in growing unless turned completely under. The spring tine cultivator—or the combined drill and cultivator which is more generally used—will cover almost twice as much ground in the same time and with the same team as required for the skim plough, and with the exception of the tightest rooted varieties of weeds, leaves them lying completely torn up on the surface of the soil, and a few hours of sunshine will wither them up completely. Two other great advantages of this implement are:—1. That the finer particles of soil are run to the bottom of the working, forming an ideal seed-bed for the subsequent crop, and leaving the light loose soil and all rubbish on the surface which, where the conservation of moisture in the soil is of importance is of great value in assisting to prevent evaporation. 2. The spring tine lends itself more readily than any other implement to a combination with the seed drill. The slight extra weight involved not being any serious disadvantage when doing cultivation work, while the advantage of giving the final cultivation and drilling in one operation on fallow or any clean ground is a great consideration from a time-saving point of view when the crop is going in. Evenness of depth and covering of the seed is, I believe, more effectively controlled with the tine drill. On stubble or bushy land a disc drill is necessary, and where this is required some farmers may prefer to cultivate and drill separately, but I think these will be in a minority. I have not referred to the work of the scarifier, or heavy rigid tined cultivator as I regard this slower and heavier type of implement as a back number except in rare instances where circumstances may warrant its use. One implement of great usefulness and the cheapest of all to operate is a set of good harrows. For breaking down the surface of rough ploughing, giving the weeds an extra worrying after cultivating, running over the ground quickly after a shower when time will not permit of other working, for smoothing down before drilling, and for making a good finish and level surface after, have a good set of harrows always ready. However, harrows must be used with caution on land that drifts.'' (Secretary, C. Whillas, Port Lincoln.)

KYANCUTTA.

July 5th.—Present: 13 members.

Members were present from the Wudinna and Waddikee Rocks Branches. The paper read by Mr. D. Duguid, of the Wudinna Branch, was entitled ''Some Uses and Abuses of our Bureau.'' Mr. W. Hier, of the Waddikee Rocks Branch, read a paper, ''The Best Time to Start Fallowing in New Country.'' This caused a lively and interesting discussion. Mr. Shepherd, of Wudinna, considered that September was too late to fallow. The ground was then drying out, and liable to drift. Mr. Daniel did not agree with Mr. Hier's idea of keeping as much draught as possible off the plough, because he would like to pull out all the stumps possible at the first ploughing. Mr. Du Bois (Wudinna) thought that the fallow should be worked as much as possible, but did not favor too much use of the harrows. They should be used directly after fallowing to pack the ground. He also stated that in most years when there had been good early rains after harvest land ploughed early and left until the latter end of seeding had always given as good a return as fallow. Mr. Matthews (Waddikee Rocks) thought that in working the fallow the farmer should work only the flats between the sandhills, and then the ground would not blow so much. Mr. E. Dyke said he was very much against ploughing in stubble or dry grass, because it was very hard to consolidate the ground after doing so, but thought that if the stubble was not too thick, and had been well tramped over by sheep before being ploughed in, it should soon rot, and if sheep were turned on the fallow to keep the weeds in check they would materially assist in packing the ground together. After a good discussion, the general opinion was that it was as well to start fallowing as early as possible, and to so work the fallow as to avoid the possibility of drift. Where able, sheep should be run on the fallow to keep weeds down. (Secretary, J. Dyke.)

MANGALO (Average annual rainfall, 14in. to 15in.).

August 2nd.—Present: 19 members.

Farm Records.—Under the heading "Should Farm Records be Kept" Mr. F. Coles read the following paper:—"How can I make my farm pay? This is a question that is constantly passing through the minds of farmers to-day. Some say the answer is to keep cows, pigs, and poultry; some say reduce all taxation; others offer various different ways for declaring a satisfactory farm budget. No doubt relief could come from these avenues, but as with any business, so it is with farming, that there are general principles to be followed for the guidance of business on sound lines. Among the headings under which these principles can be defined are method, *i.e.*, manner of working the land, feeding of stock and management of stock, system, marketing, and records. How many members of this Branch can claim to be able to state at a moment's notice how many eggs their fowls laid for the year, or how many lbs. of milk their cows yielded over a given period, or how many lbs. of vegetables were produced from the garden? The man who keeps department records is able to look from day to day, or from year to year, just what was produced from a set of hens under certain conditions, or from his cows, or what weight of meat was consumed for rations on the farm. When a term of years has passed, he can, by his records of results, more easily enthuse his children to follow his example and business. The keeping of such records creates interest, ambition, and competition, and indicates which animals to cull, what departments need speeding up, and what scope there is for development. I believe that farmers who keep a continuous record of their production do so to advantage, and this is one channel which is deserving of more attention than it has been given hitherto." (Secretary, K. Nield, Cowell.)

WADDIKEE ROCKS.

June 27th.—Present: 11 members.

Curing of Bacon.—Mr. V. Matthews read the following paper:—"There are various opinions as to the best bacon pig, but the Berkshire and Poland China cross or the Berkshire-Tamworth cross will produce a good, streaky bacon. The colder months of the year are the best time to kill for bacon, because nearly the whole of the carcass can be used. A pig of about 180lbs. to 200lbs. is a useful weight, and after it is killed and cleaned it should be left to hang for 12 to 24 hours. A good sharp knife, a saw, and a chopper are necessary to cut up the pig. When the meat has set, first run the saw down from the tail to the nose. Cut out the backbone by chopping the rib bones close to the backbone; take out the backbone in one piece, cut off the head close behind the ears, and remove the flat pieces of lard from the ribs. Saw off the trotters, the front ones at the knees, and the hind ones at the hock joints. Cut off the hams for bacon, and leave the sides as long as possible. Cut off the shoulder close to the shoulder blade, shape the hams, and take out the bone down to the socket, sawing off the knob; this will help to cure the bone of the ham. Bone the shoulder and leave in one piece to cure. Cut out the rib bone from the sides, and level off the fleshy pieces with a knife. All scrap meat can be put into a sausage machine, or used in other ways. Treat the other half of the pig in the same manner. *Curing: Making the Brine.*—Obtain a clean pickling cask, sprinkle a thick layer of salt on the bottom, put into a pan about 6lbs. of salt, 3lbs. brown sugar, ½lb. saltpetre, mix well together and rub each piece of meat thoroughly with the mixture. Pack the meat into the cask, fleshy part upwards, and place the bacon sides on the top of the other meat. Allow to stand for about three days, and then drain off the brine and turn the meat. Make another brine by filling a clean kerosene tin bucket about three parts full of clean water. Dissolve as much salt as will float a fresh egg, add the brine previously taken off the meat, and bring all to a boil. Skim off any scum that may rise, and stand until thoroughly cold. When cold, pour over the meat, which should be turned every day, and the bacon should be left in the brine for about 14 to 16 days, hams perhaps a little longer. Rinse in cold water and hang until dry; then cover with linen bags away from dust and flies. *To Roll the Bacon.*—Beat the sides out flat with a rolling pin; sprinkle a little seasoning over the meat; then roll up tightly with a buckled strap to keep in position. Place several coils of bacon cord around the rolls about 1½in. to 2ins. apart, draw up tightly and make into half hitches to prevent slipping, and tie securely. Remove the snout and ears off the head and cut into six pieces; take out the eyes and brains and soak in salt and water for 12 hours. Obtain a large saucepan, and boil head until the meat leaves the bones; remove all the bones, and put into a dish and leave to set. When firm, it will be easily cut, and will make a very nice brawn.'' (Secretary, V. Matthews.)

WARRAMBOO.

July 12th.—Present: 15 members.

Tree Planting.—The following paper was contributed by Mr. F. Chilman:—''One of the first things to take into consideration when about to plant trees is the locality and the nature of the ground, also to note what trees are making the best headway. About a fortnight before planting dig holes about 2ft. square and 2ft. deep, and leave them open until ready for planting. If obtaining trees from a nursery, they will be packed in small pots, stand these in a tub of water for a few hours and allow the water to come half way up the pots. This will revive the trees and make it much easier to take them out of the pots. Always stand any trees in a tub of water when they reach the farm if they have been on the road for a couple of days. When taken out of the pots it will be noticed that the roots are in a round ball. Have a bucket of water handy, and gently break up this ball in the water, free all roots, and cut off any that are injured. They should then be ready to put in the hole. Have the soil slightly raised in the centre of the hole and spread the roots out all around, sloping them slightly downwards towards the side of hole. Fill in with soil, keeping all stones and pebbles away from the roots. Press dirt down firmly and then give a good watering to set the soil firmly around the roots and force the air out of the pockets. Some trees require staking. To do this always put the stake in the hole first, then plant the tree by it. The Sugar and Tooart gums grow reasonably well in sandy or limestone ground, providing any stones are removed from the hole. Where the stone is bad, it is a good plan to put in a charge of dynamite to shatter the stone and give the roots a chance to get down. Peppers do exceptionally well in sandy ground, also Tagosaste. All trees must be protected from stock until such time as the animals will not injure them. From personal experience I have found it better to raise the trees from seed, then they do not get a set back through being transferred from one district to another. Try to get the trees out early in winter—June for preference—then they become rooted before the hot, dry weather sets in. If stable manure is added to the soil see that it is well worked in, do not on any account allow the roots to come into contact with raw manure.'' (Secretary, E. Adams.)

YADNARIE (Average annual rainfall, 14.09in.).

July 12th.—Present: Eight members and four visitors.

I.C. Engines.—Mr. L. Tyler read the following paper:—''Engines other than steam are termed internal combustion (I.C.) engines. Whereas in a steam engine the fuel is burnt in a separate place, called a boiler, and the products of combustion carried by means of pipes to the engine, in an I.C. engine the fuel is actually burnt or combustion takes place inside the engine. Hence the term. I.C. engines are classified according to the fuel they use. A gas engine uses permanent gas which may be town gas from the public mains, tower gas produced in special producers, or waste gas from a blast furnace or coke oven. An oil engine uses kerosene, lamp oil, crude petroleum, or the like, which liquid fuels are usually volatilised by heat treatment in a vaporiser. The petrol motor utilises the spirituous products of petroleum which are vaporised at ordinary temperatures in a carburettor. An alcoholic motor uses the vapors of denatured alcohol and much resembles the petrol motor in detail. *General Construction.*—As a rule the cylinder of an I.C. engine is single-acting and open at the end nearest the crank, the power impulse being received at one end only of the piston, in order to avoid the use of a piston rod and stuffing box that might be injuriously affected by burning gases. The trunk piston consists of a tube closed at its inner end, and is coupled direct to the crank pin by a connecting rod, the piston thus forming cross head and guide. The clearance space at the closed end of the cylinder into which the piston does not enter is usually called the combustion chamber. In it are situated the inlet and exhaust valves for controlling the admission of the mixture and the egress of the products of combustion, a third valve being usually provided in gas engines, to regulate the admission of gas to the mixing chambers formed in the passage to the inlet valve. The valves, normally of the mushroom type with conical seats, are closed by springs and are opened inwards against the pressure of the gases by cams or a camshaft driven by gearing from the crank shaft. *Modes of Action.*—The three ideal modes of operation are—1. Constant pressure cycles. 2. Constant volume cycles. 3. Constant temperature cycles; and an engine working on one of these cycles may be either two stroke (Clark cycle) or four stroke (Otto cycle), and it may further be either single acting or double acting. The most important parts of an I.C. engine are the cylinder and water jacket; the piston connecting rod and crankshaft; the fly wheel; the valve mechanism; the governor (when fitted); vaporiser or carburettor (for oil and petrol engines); the ignition. *Cycles of Operation.*—In the great majority of I.C. engines the cycle of operations within the cylinder is completed in two revolutions of the crankshaft or four strokes of the piston and engines working on the four stroke cycle or Otto cycle are commonly termed. The camshaft of a four stroke engine naturally revolves at one-half the speed of the crankshaft since each valve requires to be acted once only during two revolutions of the engine. The four strokes of a four stroke cycle engine are reproduced. *Two Stroke Engines.*—To obtain a larger output of power from a cylinder of given dimensions and to secure a more uniform rotative effect, some I.C. engines are arranged so that a power stroke occurs in each cylinder at each revolution, as the cycle is complete in two strokes of the piston it is known as the two stroke cycle or Clark cycle. In the simplest form of engine working on this cycle, the piston, connecting rod, and crankshaft are enclosed in an airtight case which serves as a reservoir for the mixture. The engine is a two port two stroke. *Three Port Two Stroke Engines.*—To avoid the use of a non return valve in the crankcase, the three port motor has been introduced in which the mixture is taken by a third port in the cylinder that is alternately covered and uncovered by the moving piston. The piston controlled inlet port being so arranged that it is open to the crankcase when the piston is nearing the top of compression stroke. During the earlier part of the stroke a partial vacuum is formed in the crankcase and the mixture flows during the small period that the port is uncovered and covered as the piston approaches and passes the top of its stroke. The remainder of the cycle is as in the two port two stroke engine.'' (Secretary, E. Spriggs.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Kelly	21/5/32	—	"Farm Records"—F. Galloway	I. Grund, Kimba
Mangalo	11/7/32	10 and 20 visitors	Addresses—H. B. Barlow and H. D. Adams	K. Nield, Cowell
Pygery	16/8/32	12 and 11 visitors	Discussion	A. Day
Laura Bay	27/8/32	17	Discussion	W. Edson, Ceduna
Chandada	26/8/32	16	Annual Meeting	H. Chew, J.P.
Koppio	18/7/32	14	Annual Meeting	M. Gardner
Cummins	19/8/32	—	Annual Meeting	H. Roberts
Miltalie	19/8/32	150	Homestead Meeting	G. Smith
Kyancutta	4/10/32	19	Congress Reports	J. Dyke
Maltee	13/10/32	11	Congress Reports	E. Schwarz
Pinbong	8/10/32	12	Congress Reports	C. Scholz
Pygery	11/10/32	8	Congress Reports	A. Day
Cungena	13/10/32	23	Congress Reports	A. Voumard
Palabie	15/10/32	12	Congress Reports	L. Miller
Taragoro	14/10/32	9	Congress Reports	T. Winters, Cleve
Kyancutta	6/9/32	18	Congress Reports	J. Dyke
Elbow Hill	9/8/32	9	Question Box	W. Cooper
Palabie	5/9/32	7	Discussion	L. Miller, Wudinna
Kelly	13/9/32	8	Homestead Meeting	I. Grund
Pygery	13/9/32	16	"Fallow *v.* Rotation Cropping"	A. Day
Maltee	15/9/32	8	Discussion	V. Schwarz
Green Patch	22/9/32	8	Congress Reports	C. Whillas, Pt. Lincoln

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

KI-KI.

July 23rd.—Present: 10 members and four visitors.

Farming under Present Conditions.—Mr. O. Blucher read the following paper:—''Producers will agree that farming under present conditions is not a very profitable proposition with wheat at about 2s. 6d. to 2s. 9d. per bushel at country sidings and oats about 1s. 6d. per bushel—the two principal grains grown in the mallee country. Wheat and oats have dropped approximately 50 per cent. in price in the last two years, while the cost of production is practically the same as previously. As supply and demand generally rule the selling price of most produce, we have practically no control over the price, especially as most of our wheat is shipped to other countries. Can we continue to grow wheat at present prices? I am of the opinion that there is nothing else to do but to try and cut expenses where possible and pay more attention to mixed farming. Cheap as butter is, it probably is the best sideline where there are enough hands on the farm to do the work without employing extra labor. A few fowls will assist to reduce bill for groceries, &c., and a few pigs will help to supply meat for household use. Where fences are satisfactory and water available sheep will probably appeal to most, although wool and lambs are very low in price. Sheep give an indirect return because they help to clean the fallow and improve the soil, but generally speaking most farmers in the mallee will give wheatgrowing first consideration. Estimate of costs of production and returns in new mallee country: An average of 9bush. per acre at 3s. 1d. Port Adelaide would be £1 7s. 9d. per acre; expenses on 100 mile radius—freight 5d. per bushel 3s. 9d., bags 2s. 6d., super 4s., 10s. 3d. per acre, leaving a balance of 17s. 6d. per acre to cover the cost of putting in the crop, harvesting, carting of wheat, and wear and tear. This is not a very promising outlook. The general trend seems to be to increase the acreage under crop to make up for the low price. I agree that we should endeavor to grow more wheat, but not by sowing a larger acreage, but rather increase the yields per acre by better farming. In this district it is quite possible to increase the present average yield by at least from 3bush. to 5bush. per acre, which would considerably reduce the cost of production. A few hints as to how this can be done: Do not neglect the fallow. Do not get ready for seeding when the season breaks, but be ready. Do not be seeding when you ought to be fallowing. Do not lose heart, grow the maximum amount of wheat. The price of wheat must improve—be there and benefit when it does.'' (Secretary, P. Crowhurst.)

Alawoona Field Day.—A fine crop of Guyra oats on the property of Mr. H. J. Koch.

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

July 16th.—Present: 23 members.

The Rabbit Pest.—The following paper was read by Mr. E. Thomas:—''It can be said that the rabbit is the worst pest the landholder has to combat, and if left undisturbed will soon take possession of the land and ruin those who depend upon its produce. The destruction of the warrens by digging them out is the best and most effective method of control, and although this will take a considerable amount of time, it will be cheapest in the long run. When digging out rabbits it is advisable to have a couple of good dogs to assist; not only will they save a lot of time in directing to where the rabbits are, but will also hunt for those that are out of the warren. Where the land is rough this is not always possible. In creeks and stony ridges I prefer the use of traps. The success of this method depends largely upon the co-operation of the neighboring landholders, otherwise a large number of rabbits will migrate to the adjoining holdings and very shortly after the trapping has been completed will again return to their old homes. See that the traps are in good order, that the jaws fit together evenly and that they set off easily. Set the trap in a level position and cover it with a thin layer of sand well pressed down around the spring and the outsides of the jaws. If no damp sand is available a piece of paper with a hole cut in the centre should first be placed over the trap and then covered with sand. Always attend to the traps twice a day and close in the warrens; this can best be done with a rabbiter's hoe. The best time to trap is during the early months of the year, because when there are no more rabbits about the job can be done more quickly and more effectively. There are various methods of fumigating practised, which is a much quicker way than trapping, but where the ground is of a porous nature it is not very effective. Where the rabbits are very numerous the laying of poison in the early part of the year is a very quick method of destroying a large number of them, but unfortunately this often helps to spread the blow-fly pest. However, I consider the first two methods mentioned to be the best, and if fowls are kept on the holding the carcasses can be put to good use if boiled for them.'' (Secretary, C. Altmann.)

NETHERTON.

August 10th.—Present: Six members.

Care and Handling of Horses.—Mr. J. Johncock read the following paper:—"It is not my intention to deal with the breaking in of young horses other than to say that in all cases where possible kindness and care should be practised, and also that young horses should not be rushed into harness until they yield to mastering and become docile. Still there are so many good methods that not one of them can be claimed as better than another. To get the maximum of work from the horse careful stabling is necessary. I prefer the practice of each horse in a manger about 5ft. 6in. wide. By so doing one is sure that each horse has its fair quantity of feed. Horses should have plenty of

1932 CALENDAR 1932

MAY

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JUNE

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AUGUST

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OCTOBER

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NOVEMBER

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DECEMBER

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1933 CALENDAR 1933

JANUARY

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FEBRUARY

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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● FULL MOON.

water and as often as necessary when working. Groom carefully, taking care that the shoulders and all parts that come into friction with the harness are thoroughly cleaned and thus avoid so far as possible sore shoulders and chafing. When attaching the team to the implement always hook up the main draw-bar as short as possible, allowing, of course, free room for turning. The main draw-bar should be raised on skids to a height of 10in. from the ground, because if the bar rests on the ground the weight of the swingle-trees brings too much weight on the point of the shoulders and causes sores. The raised bar throws the weight more to the centre of the shoulders. When making the main draw-bar, allow 1ft. 3in. for each horse. For an 8-horse team, the bar would be 10ft. from eye-bolt to eye-bolt. A 5ft. swing each end for each four horses with 2ft. 6in. swings for two horses, each single horse swing 2ft. 10in. All single swings will then overlap about 4in. Connect all swings as short as possible consistently with free working room. Shorten all chains, just leaving clear walking room. The closer the team is connected to the implement the greater the working power. Be careful that the head couplings closely approximate to the width of the swings behind. The width from centre to centre of the noses of the off and near siders should be the same distance as from centre to centre of the off and near side swings. If the animals are coupled too short they are likely to chafe, if too wide they are working against each other and so losing power. I favor double reins on large teams because the length of reins necessary is too heavy on the mouth of one horse and is liable to make a sore mouth, which makes the horse guide badly, or, as is often the case, making it become slow. When starting to work with a team of fresh horses at the commencement of the season, if the horses rush their work, work them for a short time and then stop for a spell. Do this repeatedly if necessary. Horses usually only rush their work through excitement and this practice will in a day or two wear off and they will then settle down to steady work.'' (Secretary, C. Wilkin, Yumali.)

OVERLAND CORNER (Average annual rainfall, 10.50in.).
August 10th.—Present: 12 members.

Rabbit Destruction.—Mr. C. Smith contributed the following paper:—''The best ways and means of destroying rabbits are decided by the conditions and the time of the year. Phosphorised pollard is the best agent of destruction at the time when rabbits are digging in the ground for feed. By using a poison cart to lay the poison, a much larger area can be gone over. With the machine, the baits can be laid from 1ft. to 4ft. apart, according to the number of rabbits. The thicker sowing often saves going over the ground twice. By the addition of apricot jam to the mixture—2lbs. of jam to 2lbs. of poison—I have found that rabbits will take the baits at almost any time of the year and under any conditions. Two pounds apricot jam, 2lbs. S.A.P., 4galls. pollard, 2galls. bran mixed to right consistency with water will do about 20 miles, with a bait every 3ft., and every bait taken will kill a rabbit. By systematic trapping, one can keep their property fairly free from rabbits, providing neighbors do likewise. In every means of rabbit destruction, the main factor is concerted action by all adjacent landholders. Traps, like all other implements, require a fair amount of experience to make them 100 per cent. efficient. With practical experience and a certain amount of observation, one can very soon pick the faulty traps—loose jaws, stiff jaws, high plates, long catches—all lose their quota of rabbits. A trap in perfect order requires jaws that jam or lock, a level plate, a short catch, a fairly strong spring, and a stout peg. In setting a trap, one must be able to set in dry sand without paper. Wherever possible, set the trap crossways in the burrow, squat, and pad; a rabbit seems to poke his legs through the jaws with this manner of setting. To get the best results one must concentrate on the job; traps should be looked at at least four times a day. When rabbits are no longer coming in or out of a burrow, the burrow should be dug in, preferably with a crowbar; this can be done to a depth of 2ft. After this the burrows should be cultivated down where possible, and by attaching a team to a cultivator or a plough at a distance of 15ft. to 20ft., the horses have very little need to go over the ground where the burrows have been.'' (Secretary, H. Loffler.)

FIELD DAYS, PINNAROO LINE AGRICULTURAL BUREAUX.

GERANIUM, OCTOBER 26th.

Officers of the Department of Agriculture have long emphasised the value of field days as one of the best methods of making contact with primary producers and of keeping them in touch with the latest developments in agricultural practices. This year an increased number of branches of the Agricultural Bureau have included a fixture of this character in their programme of meetings for the year. Messrs. H. B. Barlow (Chief Dairy Instructor), R. C. Scott (Superintendent of Experimental Works), and F. C. Richards (Assistant Secretary of the Advisory Board of Agriculture), attended on behalf of the Department of Agriculture.

Twenty-four members of the local Branch of the Agricultural Bureau met at the institute to take part in a tour of inspection of the farms in the district. The first property inspected was that of Mr. R. Lang, a returned soldier, who is working a block of 860 acres. He has 420 acres under crop this year, 250 acres of which are on fallowed land with Gallipoli, Nugget, and Currawa wheats. The crops on the flat portions of the property are looking exceptionally well, but those on the sand are showing the effects of the excessive wet weather. From a tank situated on a sandy rise water is laid on to the 11 paddocks, into which the property is subdivided, as well as to the house and garden. A fine avenue of sugar gums adds very considerably to the attractive appearance of Mr. Lang's block.

''Two years ago,'' said Mr. Lang, ''I sank a well to augment my water supply. Imagine my surprise when the well had reached a depth of 176ft. to find in the earth brought to the surface the fossilised remains of a shark. The teeth, which I saw, were in a perfect state of preservation.''

Perhaps the best crop inspected during the day was one of 60 acres of Gallipoli sown during the first week in June with 60lb. of graded, dry pickled seed and 1cwt. of super. With a satisfactory finish to the season Mr. R. McDowell, who is a returned soldier, expects it to yield 10 bags to the acre.

Geranium Agricultural Bureau Field Day.—Messrs. H. B. Barlow and R. C. Scott (Department of Agriculture) discuss Pastures on Mr. D. Lithgow's Farm.

VALUE OF SIDE-LINES ON FARM.

Prior to coming to Geranium in 1912, Mr. D. L. Lithgow was farming at Redhill with his father. His property consists of 1,400 acres, all of which is now cleared and permanently sheep-proof fenced. His cropping this year includes 340 acres of Gallipoli, Ranee, Rajah, and Sepoy wheats. One particularly good paddock is showing an excellent growth of clovers and self-sown oats, and for some months past has carried 70 sheep, 13 horses and three foals, and seven dairy cattle. Of four of the latter Mr. Barlow said, ''It is a pity that we do not see more like them on farms in the mallee.'' These are each giving 4galls. of milk a day and producing 60lbs. of butter a fortnight.

Mrs. Lithgow, who came out to her husband two years after the armistice, is keenly interested in side lines on the farm. ''These,'' she said, ''are keeping the house going without us having to draw on our capital. I have 150 White Leghorn hens (Parafield stock), 150 chicks, and 50 Black Orpingtons. At the present time I am gathering 80 dozen eggs a week.

The outstanding feature of the conversation with all farmers interviewed was their firm conviction that ultimately farms in the mallee would be developed as livestock raising propositions in preference to devoting so much attention to cereals.

LAMEROO, OCTOBER 27th.

On October 27th, the Lameroo Branch of the Agricultural Bureau held its first field day, and despite the cold and showery weather there was an attendance of more than 50 members. With the 48 points of rain recorded last week and the 25 which have fallen during the past 48 hours, this year's harvest is assured. Take-all is noticeable in some crops, but Mr. R C. Scott does not expect it to affect the yields appreciably. In common with the whole of the State, Lameroo is having a great year for feed, and livestock are in wonderful condition. The fallows are inclined to be dirty, but this can be attributed to the continual cool and showery weather making it almost impossible to cope with weeds. Mr. H. Schultz, whose property was the first inspected, came to Lameroo from Point Pass with his brother seven years ago. An exceptionally fine crop of 99 acres of Gallipoli wheat, sown with 1bush. of seed and 90lbs. of superphosphate, is expected to yield eight bags to the acre.

From a paddock of 130 acres of Rajah wheat, free from weeds and disease, Mr. C. Hentschke expects a yield of from eight to 10 bags to the acre. A crop of New Zealand oats, a variety new to the district, should give a good cut of hay. All told, 530 acres are under crop. Mr. Hentschke has a three-year-old Clydesdale colt bred by Mr. Kelly, of Riverton.

Lameroo Agricultural Bureau Field Day.—The Progeny of two Clydesdale Mares mated with a Percheron Horse, the Property of Mr. W. J. Morcomb.

"Although I have a tractor," he said, "I only use it at seeding time. With prices for wheat so low, the tractor takes too much money out of one's pocket."

The farm carries 10 milking cows, with a pure-bred Jersey bull as the head of the herd.

"My 20 years' experience of mallee farming," said Mr. Hentschke, "have convinced me that much of the success of growing wheat in these areas is wrapped up in early sowing. Seeding must be completed by the end of June. July sowing is a gamble. The observance of this practice, and the keeping of an adequate flock of sheep, say, 400 on a 1,100 acre farm, will go a long way towards the growing of good crops."

Messrs. Spratt Brothers work two properties, in addition to having an interest in another farm. They are regarded as some of the best farmers in the district. From a tobacco tin of Derf wheat brought out from Germany Mr. Spratt has this year grown an excellent crop.

BARLEY PAYS BETTER THAN WHEAT.

"My favorite varieties are Felix and Sultan," he said, "and my bothers and I make a regular practice of getting fresh seed from Roseworthy College every three years. Since we came here from Wasleys in 1926 we have averaged 17bush. to the acre. We do all the farm work with horses and would not think of using a tractor. We also devote more attention to barley than most farmers in this district and have 90 acres under this cereal. Our barley crops in the past two years have been more profitable to us than wheat. This year the best of it will go 10 bags to the acre."

Messrs. Needs Bros. were among the first settlers to come to Lameroo, their block of 1,500 acres having been taken up by their father in 1907. The cropping includes 750 acres of Gallipoli, Ranee, and Nabawa wheats, and 50 acres of oats. The farm carries

350 ewes, and 350 White Leghorn and Black Orpington fowls, new blood being introduced from the Parafield poultry farm and the Goodheart plant at Murray Bridge.

When the party called at Mr. E. J. Trowbridge's farm his son had just started cutting a crop of Ranee wheat, sown for hay on stubble land. Three hundred acres will be reaped for grain, and Mr. Trowbridge expects the crops on the flats to go seven bags to the acre, but on the sandhills the returns will be a good deal lighter.

Mr .J. Kernick works a farm of 450 acres. He has 190 acres under wheat, his best crop being one of Ranee, which should give an average of 10 bags to the acre.

Mr. W. J. Morcom has long been interested in the improvement of the horses of the mallee, and is one of the committee responsible for the foundation of the Lameroo Horse Breeding Society. Members of the party were keenly interested in a group of eight Percheron-Clydesdale horses, the progeny of two Clydesdale mares.

Perhaps there is no more familiar name than that of Koch in the Lameroo district, and Mr. John Koch, who resides at Walkerville, was one of the pioneers of the mallee. The properties of three of his sons in the persons of Messrs. J. L., C. E., and A. J. A. Koch were the last visited. Mr. J. L. Koch has charge of the Clydesdale colt, by Bold Alexander from Lady Fabric, recently purchased by the local horse breeding society. As a sideline he is concentrating on poultry, having 150 White Leghorn hens of Parafield strain and 600 chickens. Mr. A. J. A. Koch is a past president of the Lameroo Branch and a life member of the Agricultural Bureau. Like his brother he is devoting a good deal of attention to poultry, and has 150 White Leghorn hens and 300 chicks. His Indian runner ducks, kept under ideal conditions with a concrete swimming pool, and 50 half-bred large white Berkshire pigs were very favorably commented upon. He has a nice crop of Ranee wheat and five acres of Wimmera rye grass which he proposes to harvest for seed.

Lameroo Agricultural Bureau Field Day.—A Fine Crop of Oats on the Farm of Mr. H. G. Schutz.

Referring to the day's tour, Mr. Scott said that the prospects of the wheat harvest pointed to better returns than those of last year. Only one poor crop was inspected throughout the day. With the cool weather that has been experienced crops are maturing most satisfactorily.

Other properties inspected were those of Messrs. G. H. Twelftree, J. H. Jericho, and G. Morris.

PARRAKIE, OCTOBER 28th.

''Although take-all, excessive wet weather, and rabbits have levied their toll on the crops, nevertheless there will be a lot of wheat harvested this year in the Parrakie district,'' said Mr. D. Sanderson (chairman of the Parrakie Branch of the Agricultural Bureau), when speaking at the field day held under the auspices of the local Branch of the Agricultural Bureau on October 28th. ''We realise that during the past three years we farmers at this end of the line have had a better time than those further east, and we do not begrudge them the fact that fortune has smiled more favorably on them this year.''

The attendance was somewhat disappointing, but all members said that the day had been most instuctive, the talk given by Mr. Barlow during the lunch hour on various aspects of the management and breeding of dairy cattle being singled out for special mention.

Mr. O. Hienzel's property of 954 acres was first inspected. Two hundred acres of Currawa, Walker's Wonder, and Gallipoli wheat and 36 acres of oats are under crop.

Mr. S. H. Nicholls, who before coming to Parrakie was share farming for five years with Mr. A. S. Hawker, of Rochester, is working a returned soldier's block of 870 acres. A nice crop of 77 acres of Gallipoli will be entered in the Chandos crop competition. A crop of 33 acres of Gluyas is showing signs of "going down." Fortunately Mr. Nicholls has a header and hopes to be able to harvest it without any serious loss.

Mr. Peter Ross, when he was farming at Mallala, was looked upon as one of the best agriculturists in that district, and since coming to Parrakie, where he took up an abandoned block of 1,000 acres, his right hand has not lost its cunning. Last year, with a magnificent crop of Gallipoli which yielded 36bush. to the acre, Mr. Ross brought the first prize in the Chandos crop competition to Parrakie. This year he is again pinning his faith to this variety, and has 400 acres of it in crop. He realises that livestock operations are destined to play an important part in the future development of the mallee, and with this end in view is sparing no effort in improving the standard of his horses, cattle, and sheep. As evidence of this he recently purchased a two-year-old registered Clydesdale stallion, which won first prize at the Lameroo show. As head of his herd of cattle he has an exceptionally well-grown yearling Shorthorn bull. His 150 breeding ewes have 150 lambs from three fine Dorset Horn rams bred by Mr. Coleman, of Balhannah.

Parrakie Agricultural Bureau Field Day.—A Crop of Gallipoli Wheat on Mr. P. Ross's Farm.

To ensure adequate fodder supplies, Mr. E. Isaacson has sown 60 acres of fallow with Lachlan and Algerian oats, using 1bush. of seed and 90lbs. of super. These crops presented a fine sight, and a cut of 35cwt. to two tons is expected from them.

Pioneer of the District.

Mr. A. J. Beelitz, a pioneer of the district, took up his holding of 3,600 acres 25 years ago, and has truly carved out a home from the scrub. There are 950 acres in crop for the coming harvest, and in some of the paddocks members saw very striking examples of the damage rabbits are doing. An area of 800 acres of fallow has been ploughed for next year. The property carries 700 sheep, including ewes and lambs, the latter from Southdown rams.

"My herd of 10 dairy cows is giving 9galls. of cream a week, and also supplies the local refreshment rooms with milk and butter," said Mr. Beelitz. He is a member of the Red Comb Egg Association, through which medium he markets the produce of his 200 White Leghorn and Black Orpington hens. Two hundred day-old chicks were purchased this year to maintain the strength of the flocks. Perhaps the most attractive improvement on this property is the four acres devoted to vines, fruit trees, and vegetables.

"This," Mr. Beelitz said, "has proved a very payable sideline to my farming operations. I am able to supply practically all the requirements of the district, and in addition dispose of a fair quantity at the sales that are held periodically."

Although the garden has been watered continuously for 15 years with bore water, at the time of inspection the trees were loaded with fruit, and cabbages, beet, lettuce, onions, &c., were growing in profusion.

After having spent the greater part of the week among farmers at Geranium, Lameroo, and Parrakie, Mr. Barlow said that so far as dairy cattle were concerned it was more than pleasing to be able to report that there was a genuine desire on the part of settlers to improve the quality of the cows. As evidence of this he had been asked to make inquiries on behalf of farmers for the purchase of pure-bred Jersey and Shorthorn bulls.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Ki Ki	13/8/32	10	Annual Meeting	P. Crowhurstt
Narrung	13/8/32	23	Annual Meeting	W. Lawrie. P. McLeay
Pinnaroo	16/8/32	13	Debate	H. Badman
Renmark	3/8/32	9	Annual Meeting	B. Walters
Younghusband	10/8/32	6	Annual Meeting	T. Putland
Coomandook	30/8/32	10 and 10 visitors	Address—P. H. Suter	W. Trestrail
Nunkeri	18/8/32	8	Formal	F. Ling
Marama	31/8/32	9	Discussion	T. Hinkley
Kulkawirra	12/9/32	—	Address—C. Goddard	H. Elliot, Karoonda
Paruna	2/9/32	13	Address—R. L. Griffiths	F. Sumner
Taplan	23/8/32	14	Addresses-Messrs. Griffiths, Suter, and Richards	P. Hodge, Nangari
Meribah	12/9/32	10	Address—W. Hunter	E. Carr
Coomandook	20/9/32	11	Address—R. L. Griffiths	W. Trestrail
Taplan	26/9/32	14	Congress Report	P. Hodge
Marama	3/10/32	13	Congress Report	T. Hinkley
Paruna	7/10/32	9	Congress Report	F. Sumner
Renmark	6/10/32	15	Address—J. Price	B. Walters
Barmera	10/10/32	26	Address—J. K. Taylor	C. Till
Yurgo	3/10/32	7	Congress Report	M. Walker
Netherton	12/10/32	6	Congress Report	C. Wilkin
Overland Corner	7/10/32	14	Congress Reports	H. Loffler
Overland Corner	10/10/32	15	Field Day	H. Loffler

SOUTH AND HILLS DISTRICT

CURRENCY CREEK.

June 20th.—Present: Nine members.

Beekeeping.—Mr. L. Collett read the following paper:—"Kinds of bees found in the hive: The queen bee is the mother and director of the hive. She is longer than the ordinary worker, and her work is laying the eggs for the next generation of bees. Each egg is laid in a separate cell—drones, workers, and queens' cells. The drone cells are larger, longer, and rounder than the worker cells. The worker cells are hexagonal, and can be quickly converted into honey cells when breeding and rearing is done for the season. The queen cells are long (about 1½in.) and are placed on the side of other comb. The drone is the male, and a hive is usually stocked with about 30 drones up to a couple of weeks after the young bees are hatched. Then they are killed off by the workers. They are stingless, and are honey eaters after their work is done. The worker: About 40,000 workers are contained in what is usually called a good swarm, requiring a double hive in which to work. The worker goes out with the first rays of sunlight and will go up to five miles from home to obtain honey. It is sexless. The usual methods of getting honey on a farm are—*Tree honey* is obtained by cutting open the bees' supply in the tree and taking out the comb, after driving back the bees with smoke. The comb is washed, and the honey is strained through a cloth. *Box honey.*—The bees first of all must be driven back from the comb with smoke. Then the comb taken out by cutting it away from the roof, and thus spoiling all the comb for further use. *The patent hive* is the most economical method of keeping bees. The lid of the hive lifts off and the frames are taken out, the bees being brushed off with a soft-haired brush. A hot knife is run across the comb, cutting or melting off the caps of the cells. The frames are placed in the extractor and whirled around, the centrifugal force throwing the honey on to the sides of the extractor. The comb remains on the frame to be filled and sealed again by the bees. It is ready for retaking in a good season in about nine days. *Pests in the bees.*—The moth takes a very severe toll on bees. It is usually in the form of a caterpillar that spins a web over the comb and in the corners of the hive. If a box gets the moth into it the best way is to move the bees to another box and boil the infected one. Ants are a nuisance among bees, and frequently kill out a swarm almost as quickly as moths. *Bird pests.*—Bee-eaters or native starlings, magpies, and various other insect eaters.'' (Secretary, D. Gordon.)

August 15th.

The Truck on the Farm.—Mr. H. Higgins read the following paper:—''In spite of the universal cry of 'back to the horse' that is being heard throughout the country at the present time the motor truck has come to stay. There are possibly many farmers who would have been well advised to have refrained from purchasing a car, and who now would find the money invested in it of great value in this time of depression, but the truck meets as many demands, and is capable of handling the produce of the farm so cheaply and well, that the farm where the truck could be deemed unnecessary would be hard to find. Moreover, the modern truck can have its claim fitted up so comfortably that the owner should have no compunction in using it for social purposes when these arise; but in no case can the use of a car be reversed to carry produce without serious damage to its body work. Therefore one would stress the importance of looking after and maintaining the truck so that it may give the utmost of service and show the smallest amount of depreciation. The tyres on a new truck appear to need little attention, but very often a new valve will leak slightly until it takes its seating; and the cover, being new and stiff, will appear to contain more air pressure than it really does, and thus the importance of having a reliable pressure gauge in one's kit, for no one, however clever, can ascertain by looking at a cover the correct pressure it contains, and it is of vital importance to the walls of the tyre that it has sufficient pressure to prevent the fabric from being cut or broken when passing over a hard obstacle. A trip with a load on a partly deflated cover may not show any evil effects for perhaps months after the journey has been taken, but should the driver have been unfortunate enough to break some of the cords which go to make up the fabric of the cover, he will in the end certainly get a puncture caused by the tube being bitten in its movement in and out of the crack when the truck is in motion. This puncture will really be a blessing in disguise, for on taking out the tube the break in the wall will be evident, and can then be strengthened—either with a liner or plaster—thereby saving what would certainly end in a burst, with the probable destruction of both cover and tube. Watch the covers and test the pressures, especially before carting heavy loads, and also have the best covers on the driving wheels. *The Battery.*—Nearly all present models have coil ignition, and this part of the truck is its 'heart.' Be sure to have the battery firmly and tightly fixed in its cradle, for a loose fixture will more readily spill the acid, besides seriously injuring the plates to which the poles are attached. This acid is very harmful to clothing and metal work, and will soon eat through the iron box or cradle which holds the battery in place Cover the plates with pure water—and no more. Check over once in a while the nuts making contact to various electrical parts of the truck, and do not allow any sulphating to accumulate around the poles—this will eventually act as a non-conductor and prevent the current from flowing through. *The Generator.*—This hard-worked little unit is running at high speed continuously, and as it is free from trouble, one is apt to forget its existence. Once a year the plate cover should be removed, the brushes cleaned, and, if necessary, the commutator brightened up with '00' sandpaper. There are also two bearings which need a few drops of oil every 1,000 miles. Watch the ampmeter, and should it fall below 6 to 8 amps in day time inspect the fan-belt for looseness, or it may be necessary to advance—anti-clockwise—the third brush. The distributor should be inspected occasionally, and the points kept clean, also the greaser just below it should have a few turns every 200 miles, for which this bearing—which the greaser functions—becomes worn most irregular firing will result, and eventually stop the motor. The coil should also be firmly screwed down to the frame or plate, and any rust around the connections be removed (rust being a non-conductor). Usually a renewal of oil every 1,000 miles will render good service, but the ersults of using oil for too many miles—or of second quality—will not show any injurious results immediately. One could probably use some of the high grade oils 2,000 or even 3,000 miles, and the engine would still appear to function satisfactorily; it is only after some time has elapsed of this treatment that one can detect a falling off of power, and an increase of noise in the engine. On dismantling it will probably be found that the pistons require over-sized rings, and the cylinders are more oval than one would expect. It is a very expensive practice to economise in oil. I suggest making a suitable pit where one can stand upright and check over the brake connections, springs, steering gear, body bolts, etc. In this way one can go over the important parts of the chassis in a short time and in comfort. Make this a regular practice—say every 1,000 miles, when the oil is renewed, and for this purpose see that the truck has a reliable speedometer. Keep check of each time of inspection by noting the mileage on the speedometer. Have a system—work over the truck regularly and you will be saved a great deal of expense and delay when you can least afford it.'' (Secretary, D. Gordon.)

FRAYVILLE.

July 12th.—Present: Eight members.

Farm Machinery.—The following paper was contributed by Mr. T. Eichler:—''With the high price of farm machinery at the present time, it is not only necessary to buy an implement most suitable for the work required, but also to give it every care and attention. Three of the most important points are adjustment, lubrication, and protection. If these points are neglected there will be rapid depreciation, breakages, and the loss of valuable time. For harvesters, binders, and combines, when not in use, good shelter is most important. This means a good shed so that fowls cannot roost on any implements. The harvester is a machine which has more wear and tear than any other, therefore it is necessary to use plenty of oil. Before starting reaping, the machine should have a good overhauling, all oil holes cleaned out to see that they are free from dirt. Pour a little kerosene through the oil holes to ensure that each part receives a supply of oil. Care should be taken when movable bearings are altered that they are not adjusted too tightly. The binder needs similar care to the harvester. The main point is to remove the canvasses after hay cutting is finished and hang them in a mouse-proof shed. The combine should be cleaned out as soon as seeding is finished, take out the stars and soak them in water for a day, then clean them off with some rough material. Also pour kerosene through the wheat feed if dry-pickle has been used. The plough and cultivator do not require much attention except the usual oiling.

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1933.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

BLACK MINORCAS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

Free on Rail, Salisbury. **DELIVERY.—CHICKS—February and Early March.**
EGGS—January and February.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Victoria Square, Adelaide.

C. F. ANDERSON, Poultry Expert.

Harrows should be sharpened occasionally, so that they stir up the ground and kill any weeds on the fallow. If the farmer has a small blacksmith shop he can do most of the repairing himself and thereby save expense.'' (Secretary, V. Eichler.)

HARTLEY (Average annual rainfall, 15 to 16 in.).

June 15th.—Present: 12 members.

Hints for the Farm Carpenter.—Mr. W. Yeates presented the following paper:—''All farms have a few carpenter's tools, and in the care of these is the difference between whether the job is a pleasure or hard work. A few chisels are among the most necessary tools. These should always be ground square across and with a good bevel. Care should be taken when grinding to have the bevel a shade hollow if possible, never on the round. An ordinary firmer chisel is satisfactory for soft wood, but for hard woods such as red or blue gum, jarrah etc., a good strong socket chisel is best. For the harder woods, do not grind the chisels too thin. After grinding any cutting tool, be sure and finish it off on an oil stone. This gives it a better cutting edge and keeps the tool from rusting. The handles of chisels also need care. Never use a hammer on them. A wooden mallet is easy to make. A plane or two will be very useful. These also should be well ground back. Keep one of the planes for rough work. A wooden plane is best for this and instead of grinding it straight across, have it round—almost in a half-circle, for the finer work. Keep the edge of the other plane almost straight across. A little raw linseed oil rubbed into the plane keeps the wood in good order and helps to make it work better. The hand saw is an almost indispensable tool. For cutting across the grain, seven teeth to the inch is a handy size. The setting of a saw is as important as the sharpening. It should have enough set to clear itself easily. In doing this, care must be taken to keep all the teeth even. If one is set a litte too much, it causes the saw to drag. For ripping—cutting with the grain—a saw with four teeth to the inch can be used, sharpened so that they point well forward. Too much set on this saw is worse than not enough because it makes it far harder work and much slower. In damp weather be sure and wipe the saw dry before putting it away and rub it over with an oily rag. Timber is expensive and one naturally is anxious to save as much as possible without losing any of the strength; therefore, for joist rafters or beams the timber is wanted more in depth than width; a 4½in. x 1½in. is better than a 4in. x 2in., and less timber measurement; likewise a 6in. x 2in. on its edge is stronger than a 5in. x 3in., and a saving of about one-fifth of the timber.''

Cows.—Paper by Mr. J. Brook:—If it were not for cows many farms would not be operating. It is only the ready money that is keeping cows going. So far as profits are concerned, a cow-keeper—if he had to pay for labor and feed—would be out of pocket. When selecting a cow care should be taken to see that she is an upstanding animal, with four sound quarters, a good escutcheon, and young. The bull need not be a pedigreed animal, but he should be masculine in appearance and of good conformation. For this district I prefer the Shorthorn or Friesian; they will stand the cold better than most other breeds, and give more milk. Next select a calf from this cow that nearest resembles the breed. It may take two or three calves to do this. Bring the calf into profit when she is two years old to give it a good start before it has the strain of being milked. A calf coming in too young may have a good deal of trouble, and even be lost before many years of milking. The calf should run with the cow until the milk is fit for human consumption. Take the calf away, tie it up in a place where the cow cannot see it. The following method of feeding a calf is recommended:—Feed the calf the first milking after it is taken away by allowing it to suck a piece of hollow rubber about ½in. thick, at the same time gradually raising the bucket of milk (say ½gall.) until the calf starts to suck it up. By doing this twice, most calves will drink without any further trouble. Market bull calves, except a special one that will make a good sire. Keep the best heifers. To raise a herd of 20 cows will take from the bought cow, providing the best calf is not very uncommon, about 12 years. After that there will be the sale of the bought cow and other calves. One calf should be kept each year after the herd is made up and one cow sold, so that the herd is kept young. Do not use the same bull for more than three years. All cows, bulls, and calves, 18 months old or over, should be dehorned. Feed the cows with chaff at least once a day all the year round. It helps to harden them in winter and keeps condition on them in summer. A cow must not be left in one pasture too long for two reasons:—(1) The grass gets too short, and a cow does best on long grass. (2) If eaten right down every year, in about four years there will be no grass, because all the seeds are eaten and none left to germinate. *Water.*—Keep plenty of fresh drinking water in the cow yard. If possible keep the cows in a paddock in which there is a creek, they will then be able to drink at will. The main part of milk is water; that is why they drink so much. Milk as regularly as possible, about every 12 hours. Any young person setting out to start a dairy should seek advice regarding the most suitable cow for this district. Also, keep the biggest cow or calf that can be procured—size is best when the cow is finished with and is marketed, and they are best also for breeding. Keep the cow-yard and all appliances used in the dairy as clean as possible. (Secretary, D. Harvey.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Inman Valley .	25/8/32	12	Congress Reports	H. Lewis
Mount Barker .	24/8/32	—	Address—S. B. Opie	P. Wise
Shoal Bay	6/9/32	7	Discussion	E. Bell, Wisanger
Myponga	5/9/32	19 and 15 visitors	Address—E. Fromen	C. Martin
Myponga	29/8/32	40	Address—A. H. Robin ..	C. Martin
Mt. Compass ..	1/9/32	35	Address—C. F. Anderson.	C. Verco
Monarto South.	17/9/32	28	Congress Reports	C. Altmann
Jervois	15/8/32	39	" Potato Growing," Mr. Crayton " Ensilage," T. Baily	T. Baily
Jervois	22/9/32	36	" The Cream Separator," Mr. Bromley	J. Baily
Mount Barker .	24/8/32	45	Addresses—Messrs. Hankin and W. Jacobs	P. Wise
Langhorne's Ck.	21/9/32	9	Congress Reports	P. Nurse
Port Elliot.....	24/9/32	8	"Agricultural Societies," H. Smith	J. Colebatch, Victor Harbor
Inman Valley .	22/9/32	11	Congress Reports	H. Lewis
Frayville	29/9/32	11	Address—R. Hill........	V. Eichler
Frayville	18/10/32	10	Question Box	V. Eichler
Port Elliot.....	15/10/32	12	Homestead Meeting	J. Colebatch
Mount Compass	13/10/32	120	Dairy Field Day	C. Verco
Jervois	13/10/32	32	Lecture—Dr. Cornish ...	T. Baily
Shoal Bay	11/10/32	5	Congress Report	E. Bell
Hope Forest ...	21/10/32	—	Addresses—H. J. Apps and F. C. Richards	E. Muldoon
McLaren Flat .	13/10/32	—	Lecture—H. Alderson ...	P. Wait
Macclesfield ...	21/7/32	15	" Drudgery of Milking," K. Bowen	H. Ross
Lenswood and Forest Range	25/7/32	10	Question Box	B. Lawrance
Scott's Bottom.	15/7/32	10	Report of Visit to " Urrbrae "	E. Atkinson, Cherry Gardens
Tweedvale	21/7/32	—	Annual Social	B. Schapel
Tweedvale	18/8/32	25	Annual Meeting	B. Schapel
Cherry Gardens	10/9/32	16	Working Bee and Conference Reports	A. Stone
Balhannah.....	9/9/32	23	Address—E. Leishman ..	C. Grasby
Lenswood and Forest Range	29/8/32	22	Address—M. Vickers ; Paper—C. P. Roberts	B. Lawrance
Macclesfield ...	15/9/32	—	Address—E. Ophill	H. Ross
Kangarilla	16/9/32	6	Discussion	T. Golder
Mount Pleasant	9/9/32	4	" Concrete Work," Mr. Davey	D. Smith
Springton	5/8/32	—	Annual Meeting	E. Brokate
Springton	7/9/32	15	" Dairy Cows," P. Miller	E. Brokate
Scott's Bottom.	12/8/32	7	" Farm Management," Mr. Mitchell	E. Atkinson, Cherry Gardens
Scott's Bottom.	17/9/32	9	Conference Report	E. Atkinson, Cherry Gardens
Tweedvale	15/9/32	24	" Maize," A. Brueggmann.	B. Schapel
Cherry Gardens	8/10/32	12	Homestead Meeting	A. Stone
Balhannah.....	7/10/32	14	Address—M. Vickers	C. Grasby
Longwood	15/10/32	10	Homestead Meeting	H. Haines
Kangarilla	14/10/32	7	Paper from *Journal*	T. Golder
Macclesfield ...	20/10/32	17	Address—W. J. Spafford.	A. Ross

CROWN LANDS.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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THE JOURNAL

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Department of Agriculture

OF SOUTH AUSTRALIA.

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All communications to be addressed:
"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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S. R. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

River Murray Swamp Areas.—At Murray Bridge, Thursday, February 16th (Secretary, Mr. Max Hoare).

Dairying—At Mount Barker, Thursday, May 11th (Secretary, Mr. P. Wise).

Each Conference will be opened at 10.30 a.m.

Farmers' Relief and Debt Adjustment.

In a recent announcement to the Press the Premier (Hon. L. L. Hill) stated that the Bill which the South Australian Parliament passed last session for the re-enactment for another year of the Farmers' Relief Act was a continuation of the policy of the Government to assist the primary producer by every economically sound and reasonable method available.

A committee has been appointed to investigate the whole question of the further policy of assistance to necessitous farmers and debt adjustment, and continuation of present legislation for another twelve months will allow ample time for this investigation to be carried out. This committee is comprised of representatives of the Government, the farmers, Chambers of Commerce and Manufactures, Stockowners' Association, and associated banks. The scope of the inquiry will be limited to South Australia, and the committee is required to present its report by February 14th, 1933.

Certain amendments have been made to the laws under which the Bank is financing this year's agricultural operations, and under which the proceeds of this year's crops will be distributed. These amendments have been included as the result of experience of the first year's operation of the Act which put the Bank in a position to suggest a number of improvements in the details of the scheme. It is intended that they should operate next year in respect to this year's crop, and in 1934 in respect to the 1933-4 crop. The substance of these amendments is:—

That farmers will be able to retain out of their crops a reasonable amount of grain for grist.

That farmers, upon delivery of their crop in accordance with the Act, are required to forward to the Bank the cartnotes or other documents issued by merchants or the Pool as evidences of delivery.

Where an applicant for relief retains part of his crop with the approval of the Bank for seed, fodder or grist, and the Bank is satisfied that the whole or part of the amount retained is not being used for the purpose for which it was intended, it may direct the applicant to sell or pool the balance.

Merchants, and the pool, will be required to pay the Bank for wheat delivered in its name by farmers even though the Bank is not in a position to produce any documents and the Bill indemnifies the merchants and the pool against the consequences of their having paid the money to the Bank in these circumstances. The Bank will be enabled to pay, with the proceeds of the assigned crop, as a fourth preference, interest on advances made to farmers by the Crown which, although not secured by a mortgage, are by law a first charge on the applicant's land. The principal item which will come under this provision is interest on advances for fences and water piping. Provision is made for payments to mortgagees in cases where the mortgage on a farm does not purport to provide for the payment of interest. Such mortgagees will be enabled to rank for a dividend equal to interest for one year at 5½ per cent. on such of the moneys

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secured by the mortgage which the Bank considers to be the amount of principal outstanding. Provision is made also for payment of one year's interest on an amount representing the capital value of any moneys secured by an encumbrance over the farm.

Where a farm is held under an agreement to purchase which does not purport to provide for the payment of interest on the purchase money the vendor of the farm shall be entitled to rank for payment of interest for one year at 5½ per cent. on the outstanding purchase money.

Payments of interest on Bills of Sale covering farm machinery will be limited to cases where the machinery was necessarily used in the production, harvesting, or marketing, of the crop.

If on or after October 1st the Bank has in hand any undistributed balances of the proceeds of the sale of any crops which are insufficient to pay 1s. in the pound on any outstanding claims, the Bank can postpone the distribution of those amounts and treat them as proceeds of the subsequent crop.

Several further concessions are made to applicants for relief in the clauses which provide for financing farmers for 1933-34. The scheme proposed is generally similar to that in operation in connection with the present season's crop, but there are minor points of difference, mainly as follows:—

Applicants may apply for finance to pay fire insurance on farm buildings, and for reasonable sums for medical, dental or nursing expenses, opticians' fees or funeral expenses payable for services rendered to the applicant or any member of his family during the twelve months beginning on March 1st, 1933, for veterinary services, for premiums up to £20 on life assurance policies of the farmer or any member of his family, and for subscriptions to friendly societies.

Any applicant may withdraw his application by a simple process set out in the Bill.

At present any trading bank, merchant or other person who finances or gives credit to a farmer, can obtain a certificate from the Bank for the amounts due and get payment of these amounts out of the proceeds of the crop. The present Bill proposes to limit this section to trading banks and merchants.

Security of tenure will be given to a farmer who is the lessee of his farm similar to the protection given a farmer who holds his farm under agreement to purchase.

In concluding his statement the Premier remarked that the first year of administration of the Act reflected the greatest credit on the Bank and all others concerned in its operation. It was unavoidable that there should have been some cases in which individuals encountered hardships and difficulty, but the amendments to the Act should still further minimise these.

Certified Ryegrass Seed.

The Hawke's Bay Association of Certified Grass Seed Growers has pointed out that farmers who desire to purchase certified ryegrass from Hawke's Bay should look for certain markings on the bags, tags, and insert slips. Merchants in the Hawke's Bay district stencil the bags with "Guaranteed Hawke's Bay grown, machine dressed by (name of firm)." The Department of Agriculture supervises all the certification, and they issue insert slips and tags according to the classification of the seed. On the insert slips and tags there will be found the words, "Grown on Registered Area No. ...." Following this will be "H.B. (grower's No.)," such as H.B./107, and then the paddock letter following the registered No. "H.B." stands for Hawke's Bay District, whereas if "S.C." is shown on the tag it would indicate that the area harvested is in South Canterbury. There is nothing to show the farmer that the seed is grown in Hawke's Bay except by looking for "H.B." on insert slips and tags or, in some cases where firms adopt the method of branding the bags as follows:—"2 H.B./107," and paddock letter over the code letter for seed classification.

Publications received.

"The Veterinary Journal," October, 1932. Price 2s. net. *This issue is devoted specially to Pig Diseases.*

VETERINARY INQUIRIES.

[*Replies supplied by Veterinary Officers of the Stock and Brands Department.*]

"Cleve" reports cows difficult to get in calf. Animals show decided inflammation of the vagina.

Reply—1. The condition is probably vaginitis. Try the following treatment:—(1) Douche out three times weekly with warm Condy's solution (port wine color); (2) stop a week before cow is due to come on heat; (3) one hour before service douche out with warm bicarbonate of soda solution (dessertspoonful to a pint). Just prior to doing this, rake out the outer passage of the cow. 2. You may be giving the bull too much work, especially in the case of a bull six years old that is kept in a small yard.

Rendelsham Agricultural Bureau reports—(1) *Young pigs with scabs and sores on sides of mouth;* (2) *pigs* 8-10 *weeks old, arched backs and weak in hind quarters;* (3) *young pigs scouring badly;* (4) *a cure for worms in pigs;* (5) *is bluestone beneficial to pigs—if so, what quantities to give.*

Replies—(1) This condition is due to infection through minute wounds in the skin. Bathe affected parts with warm water to which has been added a little lysol and some washing soda. When scabs are thus removed, dry gently and then smear lightly with 5 per cent. carbolised vaseline. Two or three treatments with this should effect cure. The pig should at outset of treatment be moved on to fresh clean quarters and the old quarters thoroughly cleaned up and disinfected. (2) Move pigs into fresh comfortable quarters where they can be exposed to sunlight. Give each a dose of 2 tablespoonfuls of castor oil in a little milk. Give 1-2 teaspoonfuls of cod liver oil per pig daily in swill feed, also ½oz. superphosphate. Include some fresh chopped green feed in the daily ration. (3) Give each pig a dose of 4 tablespoonfuls of castor oil; put on to light diet of easily digested feed of a swill nature in which skim milk forms a large portion. To each feed add ½ pint of limewater per pig. (To make limewater put 2lbs. fresh lime in bucket and fill up with water. Leave for 24 hours, stirring occasionally. Then decant off the clear liquid, leaving the sediment behind.) Pay particular attention to cleanliness of all feeding and drinking utensils and quarters and see that all feed given is of wholesome nature. If the diarrhoea is persistent and severe, 5 drops of chlorodyne per pig can be given daily for two or three days. (4) For three days in succession dose with turpentine at the rate of 1 teaspoonful per 100lb. liveweight. Keep the pigs hungry for a few hours each day and then give the medicine in swill feed. Twenty-four hours after the last dose of turpentine has been given, give a dose of 2ozs. Epsom salts in solution per pig. The pigs will drink this purge if diluted

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at the rate of ½oz. salts to each quart of warm milk or slop. To prevent reinfestation, move pigs to fresh clean quarters and thoroughly clean the quarters, feed troughs, and drinking vessels out regularly, at least once a week. (5) Bluestone is not commonly used for pigs, but there is no reason why it could not be given to them with quite satisfactory results as a vermifuge (worm killer) and tonic. It has given quite good results when used for this purpose with other stock (especially horses and sheep). It would, however, be necessary for the pigs to be treated individually and the prescribed dose accurately measured for each animal. If the pigs were just dosed with it in a mob from a common feed trough, some of the animals may get more of it than others, and it would be likely to produce severe digestive disturbances in them. The dose would be 5 grains per pig (up to 10 grains for large pig) twice daily for 5 to 7 days, followed up 24 hours after the last dose by a purge of Epsom salts or castor oil. The bluestone could be administered either as a pill, a drench, or well diluted in swill feed.

Narridy Agricultural Bureau reports (1) *three-year-old gelding eating manure and continually lying down;* (2) *cow with large bladderlike lump protruding from vagina.*

Reply—(1) Starve the gelding for 18 hours. At the end of that time give a drench of raw linseed oil, 1½ pints; oil of turpentine, 4 tablespoonfuls. Shake carefully before giving. Subsequently give 1 teaspoonful of powdered nux vomica night and morning for a fortnight. To give, mix with treacle and smear on the tongue. Feed regularly and on good-quality feed. (2) The condition is a prolapse (partial) of the vagina and is usually associated with a fat condition and want of exercise. You can keep the cow, but try and reduce her condition a little.

"Myponga" asks what is mange in cattle.

Reply—True mange in any animal is due to mange mites, which burrow into the upper layers of the skin, causing intense irritation, loss of hair, and thickening of the skin of the invaded area. True mange is contagious. It is uncommon in horses and cattle in this State. However, the term "mange" is usually applied by most farmers to any condition of the skin where there is a loss of hair.

AGRICULTURAL INQUIRIES.

[Replies supplied by Mr. W. J. Spafford, Deputy Director of Agriculture.]

Rust-Resistant Wheats.

Balumbah Agricultural Bureau asks: "What has been the experience of the Department of Agriculture with rust-proof and rust-resistant wheats?"

Reply—Most of the principal wheats grown in South Australia are fairly rust-resistant, or at all events rust-escaping, when grown at the proper season of the year, but nearly every one of them is liable to attack by rust in some peculiar season, and when they are grown out of their proper season. For instance, in the present season, one of the most rust-resistant varieties grown in the country—Early Gluyas—has been very badly affected by rust, but in every case seen it was because this early variety was sown early in a peculiar season. Early wheats sown in April got a good start, and as the weather in May was mild, warm, and spring-like, the plants made strong sappy growth, and headed by the end of August or the beginning of September, and when the muggy weather of the week ending September 17th was experienced the plants had not hardened sufficiently to enable them to withstand the rust. These same varieties sown in May would not have been affected by the disease. There are a number of cases of farmers sowing the same variety on the April rain and during the period mid-May to mid-June, and although the early sown crops have been affected by

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rust in most cases the late sown crops of the same variety are quite rust-free. In such a season as the present there is no avoiding some damage by rust, because it is essential to sow early in the season in some districts, and these wonderfully long-drawn out seasons are so unusual that they cannot be anticipated.

With the type of varieties of wheats being grown at present there is little to fear from rust in ordinary years, but occasionally we experience a season when even the most resistant wheats suffer.

Treating Hay with Sulphur.

Bundaleer Springs Agricultural Bureau asks: "Will the application of sulphur keep mice out of a hay stack?"

Reply—The Department of Agriculture has never treated hay stacks with sulphur to keep down the ravages of mice, but the damage done by this pest is considerably reduced in wheat stacks if a little sulphur is sprinkled on the bags whilst being stacked, and we have often been informed by reliable farmers that success has followed the use of this material in their hay. We certainly consider that the sprinkling of sulphur into hay at the rate of about ¼cwt. per ton of hay is worth trying, but we believe the best way to ensure freedom from mouse attack is to cut the hay on the green side, and to stack it on a platform built on posts on to which an overlapping sheet of tin has been fixed, or on to which a kerosene tin with the bottom cut out has been placed.

Pea Straw as a Stock Food.

Blackheath Agricultural Bureau asks: "Is good clean pea straw of much food value to stock, and would it be likely to prove injurious to cattle and horses if let have free access to it?"

Reply—Dry pea haulms make fairly good feed for farm livestock, provided that they are clean and free from moulds. They never prove injurious to horses or cattle but on the other hand are a first class roughage for animals on sappy pastures or when receiving a lot of concentrated foodstuffs. The following analyses give a comparison of the feeding value of pea straw, wheaten hay, and lucerne hay:—

Feeding Stuff.	Composition.						
	Moisture.	Ash.	Crude Protein.	Fat.	Nitrogen-free Extracts.	Fibre.	Starch Equivalent.
	%	%	%	%	%	%	%
Pea straw	10·0	6·9	9·4	1·6	35·1	37·0	16·9
Wheaten straw.	10·0	5·0	3·1	1·3	37·7	42·9	12·1
Wheat	10·0	6·2	5·1	0·8	53·5	24·4	30·9
Lucerne hay ..	10·0	8·0	14·4	1·7	38·2	27·7	33·3

Take-all.

Frayville Agricultural Bureau asks: "What is the cause of take-all? This disease appeared in a paddock which was ploughed in October, harrowed twice before harvest, cultivated in April, and drilled in May, with combine."

Reply—Take-all is a fungus disease which lives on the roots and base of the stems of wheat plants. It is encouraged by excessive looseness of the soil. It is controlled by:—1. Burning stubbles of affected crops. 2. Growing oats after wheat. 3. Carefully fallowing the land to a very shallow depth. 4. Delaying seeding until as late as is safe for the district. 5. Using more superphosphate than has been the practice. 6. Rolling the land after seeding if it is at all on the loose side.

Wild Oats.

Frayville Agricultural Bureau asks: "What is the best method to get rid of Wild Oats?"

Reply—Wild Oats are very difficult to eradicate, particularly from land that is inclined to crack when dry. Frequent shallow working of the fallow, constant use of sheep, and delaying seeding until the oats have germinated and been killed, is the usual procedure followed where this weed is troublesome.

Grasses for the Clare District.

Stanley Flat Agricultural Bureau asks: ''What grasses are recommended for the Clare district to give early winter growth?''

Reply—There are very few grasses that can be grown for a certainty in the Clare district to produce early winter growth, but good results should follow the establishment of Wimmera Rye Grass and *Phalaris tuberosa.*

Wimmera Rye Grass is easily and cheaply established where cereal crops are grown for grain, by mixing seed with the superphosphate, as it is put in the manure box of the seed drill at the rate of 2lbs. per acre. The harvesting machines pick up the seed and distribute it fairly evenly over the fields. If to be established as pure stands about 10lbs. seed per acre should be drilled in with 1cwt. of superphosphate. If to be mixed with Subterranean Clover about 6lbs. to 8lbs. seed should be added to 4lbs. of the Clover seed, and sown to each acre.

Phalaris tuberosa can be established by transplanting rooted sections about 2ft. apart each way in well cultivated land, or seed can be sown directly into the field. On good soil preparation a seeding of 2lbs. per acre mixed with superphosphate is sufficient, and then when the plants are one year old Subterranean Clover can be sown as well. *Phalaris tuberosa* is a true perennial grass which makes its principal growth during the winter, and as such is rather unique in so far as the cultivated grasses go. It should do well at and near Clare.

Although Wimmera Rye Grass is an annual it seeds itself down with such certainty that it behaves much as a perennial, and so it and *Phalaris tuberosa* can be recommended for permanent pastures.

Weevil in Grain and Sheds.

Langhorne's Creek Agricultural Bureau asks: ''Treatment for weevil in grain —how to rid bins and sheds of both eggs and adults?''

Reply—Buildings and receptacles can be readily freed of weevils if they can be made air-tight by fumigating with Hydrocyanic Acid gas, but very few sheds on farms can be treated with this highly poisonous gas, and the problem is an extremely difficult one in most cases. It is a matter of common experience now that whenever wheat is pickled with dry Copper Carbonate power in a shed or barn enough of the finer particles of copper carbonate settle on the inside of the building to kill all weevils, and the structures remain free from the pest. The dusting of the insides of shed with finely powdered copper carbonate, through a dust-gun, would eradicate the pest, and as only a small quantity of the powder would be necessary, no harmful effects to grain stored in the sheds would result. Weevils in grain can be killed by shooting the grain into bins which can be made air-tight, and then pouring carbon bisulphide into a basin resting on the top of the grain and closing the lid of the bin. About 4lbs. to 5lbs. of carbon bisulphide are sufficient for 1,000 cub. ft. of air space, and when calculating requirements allowance is made for the grain present.

The average production of dairy cows in Great Britain is 574 gallons of milk a year; in Denmark, 571 gallons; Germany, 520; Norway, 445; Australia, 290 gallons.

THIS SHOWS THE URGENT NECESSITY FOR IMPROVING METHODS OF FEEDING IN AUSTRALIA WITHOUT DELAY.

USE

MEGGITTS
LINSEED
MEAL
FOR DAIRY COWS

TENTH AND CONCLUDING REPORT ON THE TURRETFIELD DEMONSTRATION FARM (1921-32) INCLUDING DETAILED ANALYSIS OF MEAN FARMING COSTS OVER THE SAME PERIOD.

[By ARTHUR J. PERKINS, Director of Agriculture.]

PART I.

FINANCIAL ASPECTS.

1. DETAILS OF THE SCHEME UNDER WHICH THE FARM HAS BEEN WORKED.

In 1921 the Government of the day decided that the Turretfield Farm should be run upon business lines, that is to say, from its own revenues, and without the assistance of a State grant, but subject to overdraft rights not exceeding £2,200. Towards this end, Land and Improvements were valued by the State Land Board, and an independent valuation was made of Stock and Plant. The combined Capital Value of Land, Improvements, Stock, and Plant was finally assessed at £17,590 18s. 2d., upon which sum, apart from repayments, we have had to pay interest to the State Treasury at the rate of 5 per cent., *i.e.*, £879 10s. 11d. per annum. In addition to the above we have paid 6 per cent. on overdraft Balances. In 1924-25 we had a favorable season, combined with high prices for farm produce, and were able to reduce the Loan Account by £1,000 and were allowed corresponding reduction in interest charges.

It must be stated here that relatively to the manner in which the business of Farming is conducted in South Australia generally, Turretfield under the above arrangement was placed in an exceedingly unenviable position. In the first place it had to be run upon 100 per cent. Loan Money, interest upon which had to be paid regularly into the Treasury, and secondly, from the Manager downwards it had to be worked by a salaried staff, and was therefore without the stimulant of home labor. In the circumstances it speaks volumes for the management that over the first 6¾ seasons we should have been able to close the Farm Accounts on regular Credit Balances aggregating £2,748 18s. 3d., or an average of £407 4s. 11d. per annum.

Between 1928-29 and 1931-32, inclusively, on the other hand, *i.e.*, during four successive seasons, our Farm Accounts closed on Debit Balances, aggregating £4,371 7s. 5d. Hence, under the influence of unfavorable seasons and falling prices, not only were the Profit Balances of seven seasons wiped out, but in addition the transactions of 10¾ seasons closed eventually on a Debit Balance of £1,622 9s. 2d., as shown in the accompanying Balance-Sheet. It follows that after regularly meeting our obligations for 10 years we were obliged in 1931-32 to default in the matter of interest owing to Government for the year to the extent of £601 15s. 6d.

Briefly, the financial transactions of these 10¾ years admit of being summarised as follows:—

	£	s.	d.
1921-32 Inclusive Farm Expenditure	32,815	14	0
Less 1921-32 Farm Revenue	32,213	18	6
Debit Difference	601	15	6
Add Inventory Differences	1,020	13	8
1921-32 Net Loss	£1,622	9	2

I shall point out that in a Total Expenditure of £32,815 14s. was included £9,426 0s. 5d. representing moneys paid into the Treasury for interest on Loan Account and Overdraft (including £601 15s. 6d. in which we made default). Hence, interest charges have represented 28.72 per cent., or more than one-quarter of inclusive expenditure. This heavy drain on Farm resources is attributable to the fact that we had been placed in the abnormal position of working a farm on 100 per cent. borrowed money. A fairer arrangement, or, at all events, a more normal one, would have been to place us in the position of a farmer who had been able to find 50 per cent. of the Capital required, and had met the balance by means of a Mortgage. In such circumstances, instead of paying out £9,125 19s. in the way of Interest on Loan Account, we should have paid £4,562 19s. 6d. only; and whilst in such circumstances our actual Loss at the end of the 1931-32 Season would from a Bookkeeping standpoint have been no less great, we should still have had in the neighborhood of £3,000 towards tiding us over the period of low prices.

As matters stood, it was impossible for us to continue, and accordingly I recommended to my Minister that the present arrangement for running the Farm be discontinued, and eventually this was done.

Hence, the present is the last report on the Turretfield Demonstration Farm, together with the detailed record of Farming Costs incurred on this Farm.

2. BRIEF STATEMENT OF FARMING PRACTICES ADOPTED.

Apart from 71 acres of useless River bed, the net available Farming Area was represented by 1,533 acres, distributed as follows:—

	Acres.	Percentage.
Arable Land	1,266	82.6
Non-arable grazing Land (mostly hilly)	252	16.4
Buildings, yards, plantations, etc.	15	1.0
Total Available Farming Area	1,533	100.0

During the 11 years that Turretfield was worked under the conditions indicated above, a three-course Rotation, including—(1) Bare Fallow, (2) Wheat, and (3) a grazing crop (usually Oats) or natural pasture—was usually adopted, coupled occasionally with a two-course Rotation involving Pease and Wheat. In the earlier years the bulk of the Wheat crop was cut for Hay, but when with the gradual disappearance of the City demand for chaff, Hay growing became unprofitable, no more was subsequently cut at Turretfield than was actually required for Farm use. Originally Pigs and a small Dairy Herd were associated with arable farming; eventually, however, in the absence of home Labor both had to be abandoned and their place on the Farm was taken by a Fat Lamb Flock.

3. GENERAL SEASONAL CONDITIONS.

In the main, in this State, general Seasonal Conditions controlling Farm Crops are determined by the yearly Rainfall and its distribution over that part of the year—April-November—during the course of which Winter-sown crops make their growth. Turretfield Rainfall Statistics for the 11 seasons have been summarised below in Table I.:—

TABLE I.

Summarising 1921-31 *Turretfield Rainfall Distribution.*

Seasons.	Late Summer and Autumn Rains, Jan.-March.	Seeding Rains, April-May.	Winter Rains, June-July.	Spring Rains, Aug.-Oct.	Early Summer Rains, Nov.	Harvest Rains, Dec.	"Useful" Rains, April-Nov.	Yearly Rainfall.	Mean Wheat Yield per Acre.
	In.	In.	In.	In.	In.	In.	In.	In.	Bush.
1921 ..	3·87	3·26	2·84	6·05	1·92	1·56	14·07	19·50	—
1922 ..	1·52	4·69	5·32	4·33	—	2·76	14·34	18·62	15·08
1923 ..	0·46	6·10	7·76	7·96	0·41	2·42	22·23	25·11	9·93
1924 ..	3·88	2·41	3·09	8·22	2·19	0·22	15·91	20·01	23·91
1925 ..	1·19	3·39	3·11	6·38	0·58	0·05	13·46	14·70	23·42
1926 ..	0·94	3·33	3·85	7·76	0·82	0·41	15·76	17·11	19·33
1927 ..	1·47	2·32	3·51	3·85	1·55	1·32	11·23	14·02	21·27
1928 ..	4·17	2·42	3·91	4·01	0·09	0·30	10·43	14·90	18·38
1929 ..	0·79	1·29	3·22	4·10	1·42	2·62	10·03	13·44	17·47
1930 ..	0·47	1·78	3·84	6·78	0·72	0·36	13·12	13·95	18·79
1931 ..	0·97	3·42	5·25	6·05	0·19	0·09	14·91	15·97	20·35
Means	1·79	3·13	4·15	5·95	0·90	1·10	14·13	17·02	19·49

Of the above seasons, one—1923-24—was excessively wet, with the result that all of the land fallowed in the preceding season could not be sown and the mean yield per acre—9.93bush.—was the lowest in the series. On the other hand, 1929-30 and 1930-31 were dry and low yielding seasons.

4. CLOSING BALANCE-SHEET.

The attached closing Balance-sheet shows that after deduction of £3,126 for depreciation on Improvements and Plant on the one hand, and allowance for Interest charges of £9,426 on the other, the 11 years' farming operations at Turretfield closed for reasons already given on a Debit Balance of £1,622 9s. 2d.

For purposes of comparison the mean prices realised in each season for main saleable products—Wheat, Wool, and Fat Lambs—have been shown in Table II. in juxtaposition with Credit or Debit Balances of each corresponding season.

TABLE II.

Setting out Mean Prices realised for Main lines of agricultural Products in contrast with respective Credit or Debit Balances.

	Yearly Balances.	Mean Prices Realised.		
		Wheat per Bushel.	Wool per Lb.	Fat Lambs per Head.
	£ *s.* *d.*	*s.* *d.*	*d.*	£ *s.* *d.*
	Profit Balances.			
1921-22	398 11 6	4 8	4·3	0 14 2
1922-23	483 15 9	4 10	7·5	1 4 4
1923-24	215 5 11	4 1	19·5	1 6 3
1924-25	1,173 15 10	6 0	15·6	1 10 4
1925-26	79 5 2	5 9	12·4	1 2 2
1926-27	101 1 7	5 6	13·3	0 18 10
1927-28	296 2 6	5 4	17·1	1 2 10
	Debit Balances.			
1928-29	530 12 3	4 9	12·7	1 5 1
1929-30	757 5 0	4 7	6·3	1 1 11
1930-31	2,697 17 11	1 9	4·8	0 15 1
1931-32	385 12 3	3 4	7·6	0 13 6

There are two seasons which stand out in the above Table, 1924-25, in which weather conditions were exceptionally favorable, and Wheat yielded close on 24bush. to the acre on the one hand, and on the other Wheat realised 6s. a bushel, Wool 15½d. a lb., and Fat Lambs £1 10s. 4d. a head; this season closed on a Credit Balance of £1,173 15s. 10d. The other outstanding season was 1930-31, which closed on a Debit Balance of £2,697 17s. 11d.; weather conditions were relatively unfavorable, resulting in a mean yieled for Wheat of 18¾bush. to the acre. The price realised for Wheat was 1s. 9d. per bushel only, for Wool 4¾d. per lb., and for Fat Lambs 15s. 1d. per head.

In this connection it must be pointed out that the reduced value of commodities we had for sale was not the only way in which the general fall in prices affected our more recent Balance-sheets. The Fat Lamb Flock, exclusive of Rams, had to be written down on March 31st, 1930, from 27s. 9d. to 19s. a head, representing an aggregate loss of £431 for the season. Again, on March 31st, 1931, values were reduced to 16s. 6d., representing an aggregate Loss of £620 19s. since 1929. Hence, in the course of two successive seasons, the Per Head value of the Flock was reduced by 11s. 3d. or over 40 per cent. of the original value.

5. RATE OF INTEREST EARNED BY CAPITAL ENGAGED AT TURRETFIELD.

If, from the standpoint of a farmer working a farm mainly on borrowed capital, we look upon the funds engaged in Turretfield as being represented by the original State advances, namely, £17,590 18s. 2d., plus net profits, if any, and less part repayment of original Loan, then the rate of interest earned by the farmer in each successive season would have been as indicated in Table III.

TABLE III.

Showing Rate of Interest per annum earned by Capital invested in Turretfield Demonstration Farm in each successive season.

	Capital Engaged in Farm.		Farm Net Earnings.		Rate of Interest Earned.
	Total.	Per Acre.	Total.	Per Acre.	
	£ s. d.	£ s. d.	£ s. d.	s. d.	%
1921-22	17,590 18 2	11 9 6	1,019 12 7	17 9	7·73
1922-23	17,989 9 8	11 14 8	1,306 19 7	17 1	7·27
1923-24	18,473 5 5	12 1 0	1,094 8 10	14 3	5·92
1924-25	18,689 11 4	12 3 10	2,024 10 7	26 5	10·83
1925-26	18,863 7 2	12 6 1	873 8 0	11 5	4·63
1926-27	18,942 12 4	12 7 2	922 6 5	12 0	4·87
1927-28	19,043 13 11	12 8 5	1,118 3 4	14 7	5·87
1928-29	19,339 16 5	12 12 4	237 16 9	3 1	1·23
1929-30	18,809 4 2	12 5 5	8 13 7	0 2	0·05
1930-31	18,051 19 2	11 15 6	Loss	Loss	Loss
1931-32	15,354 1 3	10 0 4	483 19 5	6 4	3·15
Means, 10¾ seasons ...	18,286 3 7	11 18 7	671 5 2	8 9	3·67

NOTE.—In the above Table "Farm Net Earnings" are taken to represent Farm Gross Revenue, less costs, but exclusive of interest on Capital or Overdraft.

6. MANAGEMENT AND LABOR INCOME.

The earnings of Capital as set out in Table III. do not interest the farmer so much as his personal earnings, or what has come to be known as his "Management and Labor Income." In attempts at determining this "Income" the position is usually complicated on the average farm by the use of unpaid family labor. Actually the "Management and Labor Income" of a Farmer can be described as the difference between Gross Farm Revenue and Expenditure, inclusive of interest and depreciation charges, plus an estimate of the value of unpaid home Labor, but exclusive of any charge for the Farmer's personal Management and Labor. Towards this end we shall be able to make use of Table III. in order to determine what would have been the mean value of the "Management and Labor Income" of a Farmer had Turretfield been run as a private Farm.

The "Net Farm Earnings" of Table III. have been defined as "Farm Gross Revenue" less "Farm Expenditure," but exclusive of Interest on Capital or Overdraft, and the Mean "Net Farm Earnings" for 10¾ years were shown to have been £671 5s. 2d. per annum. On the other hand, in the "Mean Farm Expenditure" which was deducted from "Gross Revenue" was included a sum of £1,154 10s. 1d., representing mean cost of Management and Labor at Turretfield. If we add the cost of Management and Labor—£1,154 10s. 1d.—to Net Farm Earnings—£671 5s. 2d.—we get £1,825 15s. 3d., which can be taken to represent the Net Earnings of a Farmer, his family, and his Capital if we assume that he used no hired Labor. On the other hand, if we look upon mean interest charges—£876 16s. 9d.—as the earnings of his Capital and deduct the latter from £1,825 15s. 3d. we shall have £948 18s. 6d. as representing the mean Management and Labor Income of the Farmer and his Family, on the assumption that no hired Labor were engaged. Finally, if from the latter figure we deduct £827 6s. 8d., *i.e.*, the Mean Cost of Wages at Turretfield apart from the Manager's Salary, and which we shall assume to be the value of unpaid Family Labor, we shall get £121 11s. 10d. as the Mean value of the Farmer's Management and Labor. This low figure is brought about by the Losses incurred over the last four seasons, when the Mean Value of "Management and Labor Income" was actually a negative figure of £824 15s. 8d. In the preceding seven years the Management and Labor Income was positive and represented by £682 8s. 2d.

7. INTEREST ACCOUNT.

In the statements appearing in the second part of this Report, in which it is sought to determine inclusive "Costs" of various farming operations, interest charges are derived from two sources, namely:—

(1) Interest on original Loan, less repayments, plus interest on Overdraft, and

(2) Interest on accumulated Net Profits, if any.

The position of interest to be distributed among the various Real Accounts in each season is shown below in Table IV.:—

TABLE IV.

Showing Interest Paid or Debited in each Season.

Seasons.	Interest Due on Government Loan and Overdraft.	Interest Debited on Accumulated Net Profits.	Total Interest Debited Against Farm Accounts.
	£ s. d.	£ s. d.	£ s. d.
1921–22 (9 months)	659 5 0	—	659 5 0
1922–23	874 0 10	19 18 7	893 19 5
1923–24	928 16 7	44 2 4	972 18 11
1924–25	901 6 4	54 18 8	956 5 0
1925–26	845 0 3	113 12 5	958 12 8
1926–27	872 1 7	117 11 8	989 13 3
1927–28	872 16 4	122 12 9	995 9 1
1928–29	830 13 0	137 8 11	968 1 11
1929–30	828 5 8	110 18 4	939 4 0
1930–31	884 16 0	73 1 1	957 17 1
1931–32	928 18 10	—	928 18 10
Total Interest Charges	9,426 0 5	794 4 9	10,220 5 2
Mean Charges per annum	876 16 9	73 17 8	950 14 5

8. DEPRECIATION ACCOUNT.

In Table V. below data have been summarised relative to Depreciation Deductions from Capital since 1921:—

TABLE V.

Summarising Depreciation Deductions from Capital, 1921-32.

	Buildings.	Fences.	Water Service.	Tools and Plant.	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Original 1921 valuation	2,388 10 0	990 0 0	79 10 0	724 10 0	4,182 10 0
Subsequent additions	415 14 10	457 15 5	177 17 2	1,752 0 2	2,803 7 7
Totals	2,804 4 10	1,447 15 5	257 7 2	2,476 10 2	6,985 17 7
Less Sales and transfers	10 3 11	88 12 9	—	90 0 3	188 16 11
Original values	2,794 0 11	1,359 2 8	257 7 2	2,386 9 11	6,797 0 8
Less 1921-32 depreciation	696 2 6	745 9 5	98 5 7	1,586 12 0	3,126 9 6
1932 valuation	2,097 18 5	613 13 3	159 1 7	799 17 11	3,670 11 2
1921–32 Depreciation	696 2 6	745 9 5	98 5 7	1,586 12 0	3,126 9 6
Percentage of capital assets, plus additions, less sales	% 24·9	% 54·8	% 38·2	% 66·5	% 45·9

The statement (Table V.) shows that during the 10¾ seasons we have written down Capital Assets by £3,126 9s. 6d., or nearly 46 per cent. of original values. It is sometimes urged that Farmers' Balance-sheets should take account neither of Interest nor of Depreciation. If we had followed this suggestion our 10¾ years' transactions would have closed at an apparent profit of £10,930 instead of an actual Loss of £1,622.

9. HOUSE-KEEPING ACCOUNT.

The Farm has been responsible for the Board of the Manager, his family, and portion of the Farm Staff. In Table VI. below the mean Costs of 10 years' house-keeping have been summarised:—

TABLE VI.

Summarising Mean 1922-32 *House-keeping Costs.*

Items.	Total Costs. £	*s.*	*d.*	Percentages.
Labor	79	15	5	26·1
Provisions	101	10	0	33·2
Farm Produce	60	18	7	19·9
Water	3	6	6	1·1
Kerosine	5	4	11	1·7
Firewood	9	3	6	3·0
Depreciation	45	17	7	15·0
	305	16	6	100·0

Mean number of persons catered for, 5·25.

Costs per person—

	£	s.	d.
Per day	£0	3	2
Per week	1	2	4
Per annum	58	4	2

10. WAGES ACCOUNT.

The mean amount per annum disbursed for Wages (inclusive of the Manager's Salary) during 10 years aggregated £1,127 6s. 8d. and was distributed as indicated below in Table VII.:—

TABLE VII.

Summarising 1922-32 *Distribution of Wages.*

	Totals. £	*s.*	*d.*	Percentages.
General Working Expenses A/c	219	16	3	19·5
Sheep A/c	142	9	0	12·6
Stores A/c	117	2	11	10·4
Hay A/c	97	18	5	8·7
Fallows A/c	93	5	8	8·3
Wheat A/c	91	9	9	8·1
Permanent Improvements A/c	76	1	0	6·7
Working Horses A/c	73	16	10	6·6
Implements A/c	55	10	9	5·0
Pigs A/c	50	17	10	4·5
Cattle A/c	43	19	10	3·9
Barley and Oats A/c	24	3	10	2·2
Garden A/c	16	6	2	1·4
Pease A/c	9	6	7	0·8
Grazing Crops A/c	8	4	3	0·7
Preparation of Stubble Land A/c	3	0	2	0·3
Poultry A/c	2	5	8	0·2
Permanent Pastures A/c	1	11	9	0·1
Totals	£1,127	6	8	100·0

TURRETFIELD DEMONSTRATION FARM.

CLOSING BALANCE-SHEET AS AT MARCH 31ST, 1932.

B

Liabilities.

	£	s.	d.	£	s.	d.
Loan capital—						
For land and improvements	14,237	0	0			
Floating	3,353	18	2			
	17,590	18	2			
Less Amount repaid	1,000	0	0			
				16,590	18	2
Sundry creditors				474	18	1
Interest on capital				928	18	10
Bank overdraft				380	15	6
				£18,375	10	7

Assets.

	£	s.	d.	£	s.	d.	£	s.	d.
Land	10,779	0	0						
Clearing operations from inception	224	3	5						
				11,003	3	5			
Buildings and improvements taken over	3,458	0	0						
Add Expenditure since taken over	952	10	9						
	4,410	10	9						
Less Depreciation	1,539	17	6						
				2,870	13	3			
							13,873	16	8
Tools and plant				912	19	1			
Less Depreciation for year				113	1	2			
							799	17	11
Farm produce				—			287	6	3
Livestock—									
Horses				426	0	0			
Cattle				31	15	0			
Pigs				3	0	0			
Sheep				572	2	0			
Poultry				4	2	6			
Dogs				1	0	0			
							1,037	19	6
Value of farm fallows on March 31st, 1932							466	5	4
Preparation of stubble land for 1932/33 crops							2	5	1
Sundries							97	5	4
Manures							4	10	7
Adjustment A/c.							0	17	8
Sundry debtors							181	13	9
Cash in hand							1	3	4
Losses—									
1928–9	£530	12	3						
1929–30	757	5	0						
1930–1	2,697	17	11						
1931–2	385	12	3						
				4,371	7	5			
Profits—									
1921–2	398	11	6						
1922–3	483	15	9						
1923–4	216	5	11						
1924–5	1,173	15	10						
1925–6	79	5	2						
1926–7	101	1	7						
1927–8	296	2	6						
				2,748	18	3			
1921-32, net loss	—			—			1,622	9	2
Including depreciation	£3,126	0	0						
and interest	9,426	0	0						
							£18,375	10	7

PART II.

DETAILED ANALYSIS OF FARMING COSTS.

1. CAPITAL ACCOUNT.

It is obviously of importance to know the Capital Outlay required for farming in our Central and Lower North Districts. I propose, therefore, examining this question in detail from the experience of eleven years' farming operations at Turretfield.

It should be observed that on any Farm the Capital engaged is liable to vary from year to year; assets depreciate progressively; new purchases are made; and old implements may be sold. At Turretfield the value of Capital engaged has been represented successively by—

(1) the value of Government 1921 original advances, representing Land, Improvements, Original Stock and Plant, &c., less such repayments as may have been made towards reduction of these advances, and

(2) the value of such purchases as may have been made since 1921, together with accumulated Net Profits, which, whilst they lasted, have been treated as Turretfield Personal Capital.

Detailed analysis of the Capital Account on the 1st of July, 1921 (original), and on the 1st April, 1931 (closing), is shown below in Table VIII., together with corresponding mean figures for the 1921-31 period.

TABLE VIII.

Detailed Analysis of Capital Account, 1921-31.

	Capital, July 1st, 1921.	Capital, April 1st, 1931.	Mean 1921-31 Capital.		
			Total.	Per Acre.	Per Cent.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	
Land	10,779 0 0	10,984 7 8	10,873 5 11	7 1 10	59·5
Buildings, &c.	2,388 10 0	2,144 4 1	2,251 5 9	1 9 4	12·3
Water service	79 10 0	178 17 11	147 9 10	0 2 0	·8
Fencing	990 0 0	645 19 3	810 2 5	0 10 7	4·4
Land and improvements	14,237 0 0	13,953 8 11	14,082 3 11	9 3 9	77·0
Tools and plant ...	724 10 0	953 10 1	1,164 12 1	0 15 2	6·4
Working horses ...	417 0 0	439 0 0	421 0 3	0 5 6	2·3
Other livestock ...	863 3 6	701 18 2	1,116 5 10	0 14 7	6·1
Produce on hand ..	580 10 0	609 2 2	1,804 15 10	0 8 11	3·7
Farm Fallows	330 0 0	544 10 10	523 17 10	0 6 10	2·9
Sundries	438 14 8	171 18 11	292 15 11	0 3 10.	1·6
Floating Capital .	3,353 18 2	3,420 0 2	5.323 7 9	2 14 10	23·0
Total Gross Capital.	—	17,373 9 1	19,405 11 8	—	—
Less Cash Balance	—	2,019 7 10	1,028 9 11	—	—
	—	—	18,377 1 9	—	—
Less Repayment of Principal	—	—	90 18 2	—	—
	17,590 18 2	15,354 1 3	18,286 3 7	11 18 7	100·0

NOTE.—In the penultimate and last columns of the above Table 8s. 11d. per acre for Produce on hand, and 3.7 per cent. of the Mean Net Capital do not correspond to the figure of the immediately preceding column for mean Total Produce on hand, namely, £1,804 15s. 10d. Obviously, Total Produce on hand on the 1st April of any one year must vary within very wide limits, according to circumstances; the whole of the preceding year's Wheat Crop might, for instance, still be on hand, or, again, the bulk of it might have been sold. Hence, in order to avoid the existence of Cash Balances, in determining Capital per acre and percentages of Total Capital, the mean Debit Cash Balance of £1,028 9s. 11d. and the instalment of repayment of Principal—£90 18s. 2d.—have been deducted from the value of Produce on hand—£1,804 15s. 10d.—and the per acre and percentage figures have been calculated from the difference, namely, £685 7s. 9d.

The various items included in 1921-31 Mean Capital per acre admit of being summarily grouped together, as follows:—

	Value per Acre. £ s d.	Percentage.
Land and Improvements	9 3 9	77.0
Tools and Plant	0 15 2	6.4
Working Horses	0 5 6	2.3
Revenue Earning Live Stock	0 14 7	6.1
Farm Fallows	0 6 10	2.9
Sundries	0 12 9	5.3
	£11 18 7	100.0

2. MEAN INCLUSIVE COSTS OF FARMING OPERATIONS AT TURRETFIELD (1922-32).

Apart from the question of the original Capital essential to the acquirement and equipment of a farm, it is of equal importance to know the extent to which a farmer is likely to be involved in Cash expenditure, or corresponding Credit, for the yearly working of his Farm. Towards this end I have summarised in Table IX. mean inclusive expenditure per annum incurred at Turretfield during 10 successive seasons:—

TABLE IX.

Summarising Turretfield Mean Yearly Expenditure (1922-32).

	Total.	Per Acre.	Percentage.
	£ *s.* *d.*	£ *s.* *d.*	%
I. ITEMS INVOLVING CASH EXPENDITURE.			
A. Capital Account—			
1. Buildings and Improvements (£56 1s. 5d. wages)	92 11 10	0 1 2·5	2·3
2. Implements and Tools (£1 19s. 9d. wages)	110 15 1	0 1 5·3	2·7
3. Working Horses	35 12 4	0 0 5·6	·9
4. Sheep and other Livestock	339 3 6	0 4 5·1	8·4
Totals	578 2 9	0 7 6·5	14·3

TABLE IX.—*continued.*

Summarising Turretfield Mean Yearly Expenditure (1922-32)—continued.

	Total.			Per Acre.			Percentage
	£	*s.*	*d.*	£	*s.*	*d.*	%
I. ITEMS INVOLVING CASH EXPENDITURE—*continued.*							
B. Current Yearly Expenditure—							
1. Wages and Workmen's Insurance	842	13	5	0	10	11·9	20·9
2. Manures	166	6	4	0	2	2·0	4·1
3. Repairs to Plant	70	3	0	0	0	11·0	1·7
4. Seed Purchases	65	13	4	0	0	10·2	1·6
5. Livestock Foodstuffs Purchases	31	3	2	0	0	4·9	·8
6. Water Rates	26	0	1	0	0	4·1	·6
7. Sundries	358	3	0	0	4	8·1	8·9
8. Rates and Taxes	55	7	4	0	0	8·7	1·4
9. Interest on Land and Improvements	711	17	0	0	9	3·5	17·6
10. Interest on Loan and Overdraft	164	16	7	0	2	1·8	4·1
Totals	2,492	3	3	1	12	6·2	61·7
Totals of Items involving Cash Expenditure	3,070	6	0	2	0	0·7	76·0
II. ITEMS NOT INVOLVING CASH EXPENDITURE.							
1. Farm Produce fed to Livestock	603	19	10	0	7	10·6	14·9
2. Farm Produce used by Household	63	12	1	0	0	9·9	1·6
3. Farm Grain used for Seed	223	0	7	0	2	10·9	5·5
4. Interest on Personal Capital	79	8	6	0	1	0·4	2·0
Totals	970	1	0	0	12	7·8	24·0
Mean inclusive Yearly Expenditure	4,040	7	0	2	12	8·5	100·0

I shall draw attention to the following points in the above Table:—

1. Over 10 consecutive seasons inclusive expenditure incurred at Turretfield has been at the mean rate of £4,040 7s. per annum.

2. Of this sum £3,070 6s., or 76.0 per cent., involved actual Cash Disbursements, whereas £970 1s., or 24.0 per cent. may be taken to have been Book-keeping entries and transfers.

3. In the above statement Management and Labor has been assessed at £900 14s. 7d. To this sum, however, should be added £226 12s. 1d., representing value of provisions consumed by employees, plus rent of cottages occupied by them. This addition raises inclusive value of Management and Wages to £1,127 6s. 8d. per annum, or 14s. 8d. per acre, or, again, 27.9 per cent. of mean yearly expenditure. If from this sum we deduct the mean Loss per annum registered for these 10 years, namely, £257 0s. 9d., we shall get £870 5s. 11d., which would represent the Mean Management and Labor Income that would have been earned by a Farmer and Family, had they been mainly responsible for all manual operations.

4. This mean inclusive farm expenditure admits of grouping, as follows:—

	1922–32 Expenditure. Per Acre.	1922–32 Expenditure. Percentage.
	s. *d.*	
1. Management and Labor (including Provisions)	14 8	27·9
2. Buildings and Improvements (exclusive of Labor)	0 6	0·9
3. Upkeep of Plant (including Horses)	2 10	5·3
4. Purchase of Sheep and other Livestock	4 5	8·4
5. Livestock Foodstuffs	8 3	15·7
6. Manures	2 2	4·1
7. Seed	3 9	7·1
8. Sundries	2 11	5·5
9. Rates and Taxes	0 9	1·4
10. Interest on Capital and Overdraft	3 2	6·1
11. Interest on Land Value	9 3	17·6
	52 8	100·0

Expenditure involving Cash Payments, 40s.

By way of conclusion I shall merely draw attention to the fact that whereas interest charges absorbed 12s. 6d. per acre, or 23.7 per cent. of total expenditure, rates and taxes, concerning which so much is often heard, were responsible for 9d. per acre, or 1.4 per cent. only of total expenditure.

3. MEAN GROSS FARM OUTPUT.

It is, of course, obvious that if a Farm, the Management and Labor of which has to be met in hard Cash, is to continue operations, it is essential that the mean value of the gross farm output should exceed slightly the mean expenditure figures. The position as to mean output at Turretfield is shown below in Table X.:—

TABLE X.

Summarising Value of Turretfield Mean Gross Output per Annum (1922-32).

	Sold or Used.	Differences of Opening and Closing Inventories.	Mean Gross Output.		
			Total.	Per Acre.	Percentage
I. Crops—	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	*s.* *d.*	
Wheat	1,523 7 4	− 37 5 5	1,486 1 11	19 5	39·4
Cereal Hay	725 5 9	−115 4 6	610 1 3	8 0	16·2
Barley	154 10 2	− 9 16 11	144 13 3	1 11	3·9
Oats	59 11 4	− 5 17 11	53 13 5	0 8	1·4
Pease	53 5 3	—	53 5 3	0 8	1·3
Totals	2,515 19 10	−168 4 9	2,347 15 1	30 8	62·2
II. Livestock—					
Sheep	1,065 1 0	+ 13 19 6	1,079 0 6	14 1	28·6
Pigs	216 9 11	− 35 9 9	181 0 2	2 4	4·7
Dairy Cattle	90 4 11	− 6 7 6	83 17 5	1 1	2·2
Poultry	19 6 4	− 0 6 9	18 19 7	0 3	·5
Totals	1,391 2 2	− 28 4 6	1,362 17 8	17 9	36·0
III. Miscellaneous	129 1 7	− 56 8 1	72 13 6	0 11	1·8
Mean Farm Gross Output Per Annum	4,036 3 7	−252 17 4	3,783 6 3	49 4	100·0
Add Mean Net Loss	—	—	257 0 9	3 4	
Inclusive Mean Expenditure	—	—	4,040 7 0	52 8	

It has already been stated that owing to a succession of indifferent seasons, and particularly owing to the disastrous drop in prices for rural products, operations at Turretfield had to cease at the end of 10¾ years. Table X. shows that in the last 10 years Expenditure exceeded Revenue by £257 0s. 9d. per annum (inclusive of rates and taxes). From the standpoint of a farmer, and particularly one who had the assistance of Home Labor, the position would not have been so critical. I have already shown that the Farmer and Family, responsible for all normal operations, would have had £870 5s. 11d. per annum as Management and Labor Income; such a sum would leave ample margin for the payment of casual Labor as required. In such circumstances there would have been no loss to register, even after payment of all interest dues and making adequate allowance for depreciation of Assets.

It will be observed that the mean yearly output at Turretfield, 17 per cent. to 18 per cent. of which consists of hilly, non-arable land, was represented by £3,783 6s. 3d., or 49s. 4d. per acre on the total area. Towards this Total, Harvested Crops contributed £2,347 15s. 1d., or 30s. 8d. per acre or, again, 62.2 per cent. of total output; Live Stock £1,362 17s. 8d., or 17s. 9d. per acre, or, again, 36.0 per cent. of total output; and Miscellaneous £72 13s. 6d., or 11d. per acre, or, again, 1.8 per cent. of total output.

4. VALUE OF OUTPUT AT TURRETFIELD OF AREAS CROPPED AND AREAS GRAZED RESPECTIVELY.

From data summarised in Table X. it is possible to determine fairly accurately the Mean Yearly value of output secured during 10 successive seasons from land concerned with harvested crops only on the one hand, and from land concerned with grazing Live Stock (chiefly Sheep) only on the other. Such information is of value in any attempt to assess the relative income earning importance of Crops or Live Stock on a mixed farm of the Turretfield type.

During these 10 years the mean area under Harvested Crops was 549 acres, and the mean area treated as Bare Fallow 438 acres; hence, the mean aggregate area allotted to Harvested Crops has been 987 acres. It must be recognised, however, that these 987 acres have not been actively concerned with Crops for more than nine months in any one year, and that over the balance of the year they have been available for grazing purposes, either as stubble grazing or as natural pasture. It follows, therefore, that on a per annum basis these 987 acres are in actual fact equivalent to no more than 740 acres exclusively devoted to Harvested crops, and leaving the equivalent of 247 acres per annum available for grazing purposes. From the latter standpoint a mean output of £2,347 15s. 1d. from Harvested Crops would be equivalent to a return of £3 3s. 5d. per acre from land exclusively devoted to Harvested crops during the year.

On the other hand, the mean yearly area available for grazing purposes may be said to consist of the following fractions:—

(1) 247 acres, namely, the yearly grazing equivalent of 987 acres under Crop or Bare Fallow for nine months in the year, but available for grazing over the remaining three months.

(2) 279 acres of arable land temporarily out of cultivation or sown to grazing crops, and

(3) 252 acres of non-arable land.

Hence, over 10 successive seasons the mean area available for grazing at Turretfield has been equivalent in the aggregate to 778 acres.

The mean Value of Gross Output from Live Stock has been shown in Table X. to have been £1,362 17s. 8d. per annum; but, since over this period foodstuffs have been fed from time to time to normally grazing Live Stock, this output cannot be put down wholly to the credit of areas available for grazing; and the mean value of foodstuffs fed—£245 13s. 1d.—must be deducted therefrom, leaving £1,117 4s. 7d. to the credit of the grazing area. On the other hand, this Output must be increased by the agistment value of Working Horses, which had occasional access to the grazing areas, namely, £40 16s. 8d. Hence, the final Net Value of the Mean Output of that portion of the Farm exclusively grazed was represented by £1,158 1s. 3d., or £1 9s. 9d. per acre per annum, as against £3 3s. 5d. per acre per annum for land exclusively devoted to harvested Crops.

The following statement shows a rough approximation of differences between Revenue and Expenditure on cropped and grazed areas respectively:—

	Area Devoted to Crops.		Area Devoted to Grazing.	
	s. *d.*	£ *s.* *d.*	*s.* *d.*	£ *s.* *d.*
Mean Expenditure per Acre—				
1. Interest on Land and Improvements ..	10 5·5		8 4·2	
2. Interest on Working Capital	4 8·5		1 9·6	
3. Rates and Taxes	0 10·0		0 7·6	
4. Wages	21 2		8 10·4	
5. Other Expenditure	32 2		13 1·2	
		3 9 4		1 12 9
Mean Output per Acre		3 3 5		1 9 9
Mean Loss per Acre per Annum		0 5 11		0 3 0

Thus, then, as a result of a succession of unfavorable seasons, and recent unprecedented fall in prices of rural products Turretfield Losses over 10 years (1922-32) have been at the rate of 5s. 11d. per acre for areas devoted to crops, and 3s. per acre for areas devoted to grazing. It is necessary, however, to point out that a Farmer who employed little or no hired Labor would have been very differently situated; in effect his accounts would have shown no losses, and after meeting all interest and depreciation claims he would have received for Management and Labor 15s. 3d. per acre from Land devoted to Crops, and 5s. 10½d. from Land devoted to grazing, *i.e.*, about 10s. 5d. per acre on the area farmed.

5. INITIAL CAPITAL REQUISITE TO THE SUCCESSFUL WORKING OF A 1,000-ACRE FARM OF THE TURRETFIELD TYPE.

It will probably be recognised in this connection that apart from the position of the average man working in an average season, the minimum initial Capital requisite to the successful working of a Farm would depend upon three main factors, namely:—

(1) Individual capacity. (2) Seasonal conditions over opening years, and (3) Current market prices over the same years. In other words, if an individual farmer should have high technical capacity, coupled with business acumen above the average, if in the opening years of operations he should have the advantage of seasonal conditions and market prices above normal means, it is highly probable that this exceptionally favored individual would be in a position to start farming on a minimum personal Capital that would lead to disaster the average man facing unfavorable or even average conditions only. In the development of a new country, it is, however, inevitable that such implied risks should frequently have been taken; and, unfortunately, in such cases failures have usually outnumbered successes, and not infrequently it has been the better provided or luckier successors

of the pioneers in land development who have reaped the crops that the latter have sown. But, in this connection, it is not my intention to try and determine what should be the minimum personal Capital upon which the exceptional man, facing favorable conditions, could afford to start farming, but rather to show from carefully recorded data of 10 successive seasons what personal Capital would have been essential to an average man facing normal conditions in order to work successfully a 1,000-acre Farm of the Turretfield type.

We must assume for the purpose a Farm of this character to be situated on the heavier land of our Central or Lower North Statistical Divisions, and to consist of from 820 to 830 acres of arable land, including 9 to 10 acres under Buildings, yards, plantations, &c., and 170 to 180 acres of rough grazing land. We shall also assume that a farmer seeking to acquire and work a farm of this type on a minimum of Personal Capital would be able to secure Mortgage and Loan facilities to the extent of two-thirds of the value of his Capital assets. Reference to Table VIII. will show that the Capital requisite to the purchase and equipment of such a Farm would be represented by £11 18s. 7d. pr acre, or for a 1,000-acre Farm approximately £12,000. In the circumstances, the minimum Personal Capital essential to the purpose would be in the neighborhood of £4,000, whilst £8,000 would represent the extent of Loan Liabilities, which at 5½ per cent. would involve total interest charges of £440 per annum, or 8s. 10d. per acre.

I shall now endeavor to show on the basis of 10 seasons' records at Turretfield —1922-32—the extent to which anticipated Revenue and Expenditure would justify farming operations on an initial Personal Capital, equivalent to one-third of the Capital engaged in the Farm.

Reference to Table IX. will show that Mean Yearly Expenditure at Turretfield involving Cash payment has been at the rate of 40s. per acre. In this figure, however, are included 11s. 9d. paid out in wages, to which should be added 2s. 11d. for provisions consumed by employees and rents of Cottages, and 11s. 5d. for interest charges per acre. On the Farm that we have in view interest charges involving cash payments have been assumed to be at the rate of 8s. 10d. per acre, and if, as is usually the case, the farm were worked almost exclusively by the farmer and his family, cash payments for wages would to all intents and purposes disappear. In lieu of the latter, however, provision would have to be made for the upkeep of the farmer and his family, and in these days I suggest £250 for the purpose, or 5s. per acre. Hence, in lieu of the Turretfield figure of 26s. 1d. per acre towards payment of wages and interest charges a sum of 13s. 10d. per acre should suffice on a farm worked mainly by a Farmer and his Family. It follows, therefore, that in such circumstances actual Cash outgoings need not exceed 27s. 9d. per acre instead of 40s., as at Turretfield; on a 1,000-acre Farm this would represent £1,387 per annum in the way of Cash outgoings, including the upkeep of the farmer and his family.

Again, reference to Table X. will show that at Turretfield the mean value of Farm Output per annum has been at the rate of £3,783 6s. 3d., or 49s. 4d. per acre; of the latter sum not less than £3,066, or 40s. per acre, have represented direct Cash receipts. Hence, in the circumstances already indicated, a Farmer working a 1,000-acre Farm of the same type should be able to anticipate a mean Farm Output of £2,467, of which not less than £2,000 would represent direct Cash receipts. Output on this scale would be more than adequate to meet estimated Cash Outgoings of £1,387 per annum, and in addition would make ample provision for unforeseen emergencies and occasional use of Hired Labor.

I conclude, therefore, that in competent hands a Personal Capital of £4,000 should suffice for the purchase, equipment, and working of a 1,000-acre Farm of the Turretfield type.

6. GENERAL EXPENSES ACCOUNT.

In any business undertaking, and in farming to a greater extent perhaps than in any other, numerous items of expenditure are incurred in the course of a year's operations which cannot readily be debited directly against any particular Real Account. In the aggregate these items of expenditure represent the overhead charges which must eventually be distributed among Revenue-earning Accounts, and usually in proportion to the monetary importance of each.

Mean General Expenses incurred at Turretfield during 10 consecutive seasons (1922-32) have been summarised below in Table XI.:—

TABLE XI.

Summarising Mean General Expenses per Annum Incurred at Turretfield (1922-32).

	Total.			Per Acre.		Percentages.
	£	*s.*	*d.*	*s.*	*d.*	
1. Interest on Floating Capital and Overdraft	244	5	0	3	2	36·6
2. Wages	219	16	3	2	10	33·0
3. Depreciation	78	6	3	1	0	11·7
4. Rates and Taxes	55	7	5	0	9	8·3
5. Sundries	45	0	8	0	7	6·8
6. Use of Implements	13	15	3	0	2	2·1
7. Use of Horses	9	16	5	0	2	1·5
Totals	666	7	3	8	8	100·0
Mean Yearly Total Expenditure	4,040	7	0	£2 12 8		—
Percentage of Total Expenditure	—			—		16·5

Thus, over a period of 10 years "General Expenses" at Turretfield have been at the mean rate of £666 7s. 3d. per annum, or 8s. 8d. per acre, or, again, 16½ per cent. of Total Yearly Expenditure.

The Mean Distribution of these "General Expenses" among Revenue-earning Crops has been as follows:—

TABLE XII.

Showing Mean Distribution of General Expenses Among Revenue-earning Accounts (1922-32).

	1922–32 Mean Charges.			
	Total.			Percentage.
	£	*s.*	*d.*	
Wheat Crops	287	17	8	43·21
Sheep	142	0	9	21·31
Hay Crops	114	15	2	17·22
Pigs	37	19	7	5·70
Barley Crops	23	12	2	3·54
Dairy Cattle	20	8	7	3·07
Pea Crops	17	1	10	2·56
Bare Fallow	13	15	8	2·07
Oat Crops	8	9	7	1·27
Poultry	0	6	3	0·05
Total Mean Charges	666	7	3	100·00

(*To be continued.*)

THE CURRANT GROWING INDUSTRY IN SOUTH AUSTRALIA.

INVESTIGATION DESIGNED TO IMPROVE CERTAIN CULTURAL PRACTICES IN NON-IRRIGATED DISTRICTS.

[Work outlined by Mr. GEO. QUINN, Chief Horticultural Instructor.]

Subsequent to proposals placed before the Hon. Minister of Agriculture by the South Australian Dried Fruits Board expressing willingness to meet certain costs, Mr. Geo. Quinn (Chief Horticultural Instructor) recently stated that he had drawn up an outline of experimental and demonstrational work deemed desirable to effect an improvement in the quantity and quality of currants grown in the principal non-irrigated areas, which was submitted to, and accepted by, that body. He accompanied the members of the Board to well attended meetings of currant growers called by that body at McLaren Flat, Angaston, and Clare, on June 20th, 21st, and 22nd, respectively, and laid an outline of the proposed scheme before each meeting.

After full discussion, the growers at each centre, by resolution, agreed to co-operate in the work and elected a local Committee of three leading currant producers to represent them. Each of these Committees was asked to interview owners of vineyards in their respective districts who might be prepared to set aside small areas of vines for experimental purposes. It was also arranged that these areas would subsequently be inspected, and such as were deemed suitable would be selected by a joint Committee.

The general organisation for carrying out the investigation consists of the local Committee in each district; the owner of the vineyard; Mr. Julius Victorsen (representing the dried fruit growers in non-irrigated districts on the Dried Fruits Board); the District Horticultural Instructor; Mr. A. V. Lyon, M.Sc. Agric., Officer in Charge of the C.S.I.R. Viticultural Research Station, Merbein, Victoria; and Mr. Quinn.

The owner of the vineyard agreed to carry out all ordinary cultural practices, such as tillage, pruning, harvesting, cincturing, &c.; the District Horticultural Instructor will be responsible for seeing this is done, recording all data, and directing and assisting from time to time in such work as may require technical skill. In the above, he will confer with the local Committee in respect to local matters.

As it was the desire of the Board, Mr. Quinn discussed with Mr. Lyon (who agreed to co-operate in the work in an advisory or consultative capacity) the general plan of the work which had previously been placed before the growers, and they came to an agreement as to the procedure to be followed in carrying out the investigation. It was also agreed that Mr. Lyon should, in company with the Secretary of the Dried Fruits Board, the respective local Committees, Mr. Victorsen, the District Horticultural Instructor, and Mr. Quinn visit each of the suggested plots in each centre and select those deemed most suitable for the purpose. Owing to the demands this work was likely to make on the time of the Horticultural Division, it was agreed the programme should, at present, be limited to three principal and most urgent problems, viz.:—

(1) The reorganisation of the vines in old Currant vineyards.
(2) Testing the comparative values of Rod and Spur pruning, with Spur pruning only, and Spur pruning supplemented by disbudding unwanted shoots in the Spring.
(3) A study of crop yields in an average vineyard, preparatory to initiating a manurial test therein.

CLARE DISTRICT.

Mr. Quinn stated that in the Clare district a plot comprising some of the oldest and most debilitated currant vines in the district, and located in the rich, black alluvial soil of Stanley Flat, was accepted for reorganisation in Mrs. A. Dolan's vineyard.

In Mr. C. Neate's vineyard, on Stanley Flat, planted in alluvial soil of moderate strength, a series of plots of fair average vines will be tested for individual crop yields prior to initiating manurial trials. In Mr. W. H. Penna's vineyard, planted on hillside loam of good average quality, at Sevenhills, pruning test of Rod and Spur *versus* Spur, etc., will be undertaken. The vines in this vineyard are well trained, and being in good, healthy productive condition should prove well suited for the purpose.

ANGASTON DISTRICT.

In the Angaston district Mr. G. L. Wishart offered several rows of vines in his very old currant vineyard for renovation. Notwithstanding that they grow in deep loam, these vines have gradually dwindled in growth and production, although apparently quite healthy on the lower trunks below the cincturing scars.

In a healthy, productive, medium aged, well-developed vineyard growing on red sandy loam over clay, at Light's Pass, and belonging to Mr. P. B. Boehm, a suitable number of rows of vines have been secured for pruning tests, and a plot has also been set aside for conducting crop yield investigations in this vineyard.

McLAREN VALE DISTRICT.

In the McLaren Flat area, where nearly all the currant vineyards in this district are established, Mr. G. Bell has allotted a couple of rows of very old vines, planted in deep, sandy loam, for reorganisation work. He has also allowed the Committee to use three rows of well-trained, moderately vigorous, medium aged vines, growing on a sandy slope in soil typical of the locality for the purpose of conducting a pruning trial.

On the southern side of McLaren Flat Mr. A. C. Fraser has agreed to co-operate in the investigation by allowing preliminary crop yields to be taken in a portion of his fine vineyard. These vines, which are in full bearing and reflect careful attention in the past on the part of the owner, are growing in a good, strong sandy loam over clay.

After inspecting (in company with the local Committees) the vineyards made available in the respective districts, the work decided upon in those selected was discussed in each instance with the Committees and the owners in comparative detail. Each of the local Committees enthusiastically agreed to endeavor to arouse public interest in the local experiments and to appoint a Chairman and Secretary with a view to collecting and disbursing a small emergency fund to meet any unexpected or special expenditure on casual labor, if required, during any busy period when the owner may not be able to assist the District Horticultural Officer.

REORGANISATION OF OLD VINES.

In many of the older currant vineyards of this State most of the vines have become debilitated and economically unproductive. A critical examination reveals that the principal factors making for this condition arise, firstly, from the ill effects of faulty methods of training the permanent arms on the wire trellises; and secondly, from the devitalising influences exercised by the cincturing applied to the main stems annually over periods varying from 25 to 30 years. The faulty training consists in originally failing to establish and maintain the permanent arms of each vine on a common level, but a more serious error has been displayed in the manner in which these arms have been permanently twisted around the trellis wires. With accruing years these arms have developed into horizontal spirals, exhibiting huge dead lignified and sunken areas wherever the pressure of diverted growth attempted to envelop the wire. Needless to say, wherever such constrictions occurred, the outer end of the limb gave rise for a time to puny shoots, and eventually died.

Although vinegrowers have, for a period probably longer than the age of many of the vineyards, been warned of the evils to be expected to arise from these practices, it is only now being freely acknowledged to be a serious mistake.

The accumulative ill effects of the application of annual cincturing to the main stem of the currant vine have probably been much aggravated by the unsuitable tools frequently used, as well as by the drastic manner in which the cincture has been applied.

In the older currant vineyards in South Australia there is much support for the statement made by the late W. C. Grasby, in 1893, on his return from Greece, from whence he introduced and advocated cincturing as a means of inducing a more profitable setting of the berries on the Zante currant bunches. "In Greece," he stated, "the opinion was held that the annual cincturing of the stem reduced the profitable life time of the currant vine from 10 to 20 years—in accordance with the nature of the soil, situation, and general attention given to the plant."

As previously remarked, the bases of the stems of these old vines were reasonably sound, displaying in many instances either a wealth of adventitious buds or a scattering of watershoots, arising either just above or below ground level.

The rejuvenation to be undertaken will consist of removing the superstructure of these old vines, and leading up a watershoot to form a new stem to each one, and therefrom laying down new arms upon new trellis wires, which the owners are erecting at a greater elevation than that adopted for the old vines. The lessons from frost injuries and the ill effects of over shading the fruit, which occurs on low, crowded trellises, doubtlessly instigated this change.

Full data will be collected relative to the time taken to bring these reorganised vines back to a good standard of production, and compare the production with that of similar vines left untreated. It may be remarked incidentally that instances of growers who have taken, with gratifying success, the initiative in the above direction, are not wanting in several of the districts in which the Committee is operating.

PRUNING TESTS.

In practically all currant growing districts in this State—other than at McLaren Flat and Langhorne's Creek—the Zante currant vine is now Spur pruned. This is an evolution of practice, consequent upon the success attending the adoption of cincturing as a means of inducing a maximum setting of fruit.

The system of training adopted of late years for this vine is known as the Thomery Spalier, and modern practice indicates that a fairly high trellis is desirable when the vines are set on deep, strong land. On such a trellis alternate vines in a row are trained on the lower and higher wires respectively, each with a single pair of permanent arms. The spurs arising from these arms are carried to the third bud at their first pruning, and from thence outward by one or two buds each winter—according to their individual strengths—until short secondary arms of a semi-permanent character are developed. The result of this is to spread the frame on a horizontal plane and admit more light and air throughout to the foliage and fruit.

At the Berri Experiment Orchard, in the vine training and pruning plot, the rows of currant vines trained as cordons and spread over a T-piece trellis, and rod and spur pruned, have, over a 14-year period, produced the greatest weight of fruit borne by this variety under any form of training and pruning tested, but the fruit has been inferior to that borne on spur pruned spaliered vines in the same set of trials, which, it may be stated, are also not far behind them in gross yielding capacity.

It is proposed to test these phases of pruning by selecting in each district two or three rows of well-grown currant vines in good cropping condition—aggregating from 99 to 120 vines in all.

Discarding outside or terminal vines at each end of the row, the first vine under Treatment S will be spur pruned; the second, under Treatment SD, spur pruned and disbudded of all excess sprouts in spring; whilst the third, under Treatment RS, will be rod and spur pruned—the number of rods retained being determined each year in accordance with the strength of growths observed on the arms.

This order of treatment will be replicated from 30 to 40 times in each district plot, and each vine will be marked with a label indicating that vine's number and treatment in letters and figures.

The data to be collected will be:—

Treatment S: Total weight of fruit borne on each vine, the density of must, average size of berries, and drying ratio.

Treatment SD: Similar to S in all details.

Treatment RS: Similar to S, but separate data to be taken of the fruit borne on spurs and rods respectively.

If time permits, the prunings from the respective treatments may be collected and weighed, and possibly bud studies conducted on the canes. The comparative occurrence of seed bearing berries, "bucks," in the relative treatments will be observed and segregated if circumstances permit of drying the whole of the fruit gathered from each of the treatments separately.

CROP YIELD STUDIES (PRELIMINARY TO MANURING).

It was decided to collect over a period of several years crop data from 20 to 25 groups, each consisting of from four to six vines, the latter varying in accordance with the number of rows available in the plot placed at the Committee's disposal.

These groups are scattered in regular order throughout the rows of currant vines which have been selected because of standing in soil of reasonably even type displaying normal growth, and being subjected to fair average standard cultural treatment as followed in the district. Each of the selected groups is surrounded on all sides by rows of vines similarly treated, so that other than collecting cropping data no departure from ordinary procedure is anticipated.

The Vines in these groups will be individually and consecutively numbered from 1 to 150 with a small permanent label. The data collected will consist of recording the yield of each vine. With this data to hand it should be possible to assess the influence each of the present factors exercises in the production of the crop. By grouping the groups—based on the information the vines have supplied—the Committee may then formulate and test the values of certain manurial treatments.

It may be mentioned in conclusion, said Mr. Quinn, that a grower in the Angaston district (Mr. A. Thorn) has submitted an offer to the Committee to plant, as a demonstration plot, a small area of currant vines on lines which accumulated experience indicates as most desirable, and to submit them to methods of training, pruning, cincturing, tillage, &c., deemed to be most conducive to their permanent well being and productiveness. He is propagating the cuttings this year, so that, if his offer be renewed, the planting may take place in the winter of 1933.

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SIDELINES ON EYRE'S PENINSULA FARMS.

[By W. J. Spafford, Deputy Director of Agriculture.]

The judging of the competition for sidelines on Eyre's Peninsula farms inaugurated by the proprietors of the *Chronicle* newspaper, who also provided the prizes, was completed on October 29th, 1932. When arranging for the competition the donors had in mind the encouragement of increased production in dairying, pig raising, poultry keeping, fat-lamb breeding, and any other money-earning agricultural production except cereals and wool, and hoped that the increased production would lead speedily to the utilisation of the Port Lincoln Freezing Works or the erection and management of privately owned facilities for the handling of such products.

For the purposes of the competition, Eyre's Peninsula was divided into two districts, and the entries received in the Lower Eyre's Peninsula District were judged by the Agricultural Instructor for that district (Mr. H. D. M. Adams), whilst those received in the Upper Eyre's Peninsula District were judged by the Agricultural Instructor for that district (Mr. W. H. Brownrigg). These two judges chose what they considered the three best entries in their respective districts, and the writer judged these three entries to a set scale of points, and placed them in their order of merit, for each of the two districts:—

Sidelines on Lower Eyre's Peninsula Farms.

Side Lines.	Possible Points.	Points Allotted.		
		F. Masters, Verran.	H. C. Roediger, Yeelanna.	W. Modra, Yeelanna.
Proportion of Farm Activities	*	45	25	22
Dairying—				
Cows—				
Breed	—	Jersey	Grade Shorthorn	Grade Jersey
Appearance for milk	50	42	35	30
Care	25	20	22	20
Number in milk	12½	7	11	7
Suitability of type	12½	12	9	9
Purity	10	9	5	5
Bull—				
Breed	—	2 Jerseys	Brindle and Jersey calf	Jersey
Purity	20	20	12	15
Suitability of type	10	10	5	10
Care	10	8	8	8
Pigs—				
Breeding Sows—				
Breed	—	Berkshire	Berk. x Tamworth	Berk. x Tamworth
Suitability of type	25	17	17	17
Care	20	15	15	17
Number	15	8	7	9
Boar—				
Breed	—	Large White	Berkshire	Large White
Purity	10	10	8	8
Suitability of type	10	10	7	8
Care	5	4	4	4
Young Pigs—				
Suitability of type	8	5	5	7
Care	7	6	5	6

SIDELINES ON LOWER EYRE'S PENINSULA FARMS—*continued.*

Side Lines.	Possible Points.	Points Allotted.		
		F. Masters, Verran.	H. C. Roediger, Yeelanna.	W. Modra, Yeelanna.
Crossbred Lambs—				
Breed of ewes	—	Merino	10	—
Type of ewes	20	12		
Breed of rams	—	Shropshire		
Type of rams	20	20		
Care	10	9		
Poultry—				
Hens—				
Breed	—	Leghorn	Leghorn and Orpington	Barnyard
Suitability of type	15	14	12	8
Care of birds	15	10	9	11
Number of hens	15	13	13	10
Housing	8	3	4	4
Methods of marketing eggs	7	4	4	4
Roosters—				
Breed	—	Leghorn	Leghorn and Orpington	Orpington
Purity	8	8	7	6
Suitability of type	7	7	6	5
Other kinds—				
Suitability of type	7	5	4	5
Care	8	7	5	6
Number of birds	10	2	8	5
Other side lines—	Max. 50.			
Bees	—	—	—	—
Market gardens	—	6	—	—
Nursery stock	—	—	—	—
Other	—	—	—	—
Total points	—	368	282	266

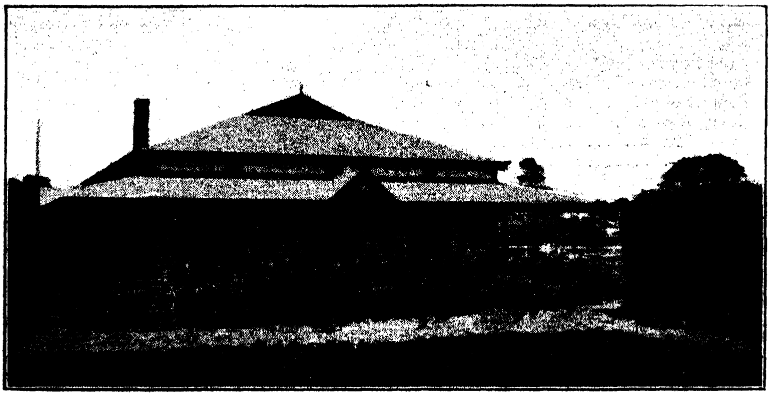
* Proportion of farm activities :—

Sidelines, 10 per cent. (wheat and sheep 90 per cent.)	25 points
Sidelines, 15 per cent.	37½ "
Sidelines, 20 per cent. to 30 per cent.	50 "

THE ENTRIES IN LOWER EYRE'S PENINSULA.

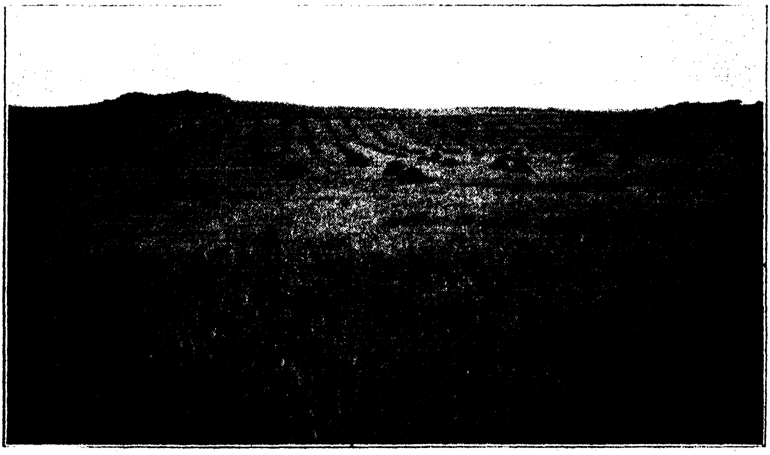
F. Masters, Verran.—The animals exhibited in the competition by Mr. Masters were a long way the best of those put before the judge, and this largely because of the fact that practically all animals kept on the farm have been pure bred, and Mr. Masters has always introduced pure-bred sires from the best flocks and herds in the State. The milking herd is comprised of six cows only, but they are good Jerseys. The heifers in the herd are much better than their dams and show the influence of the sire, a nicely furnished Jersey, which has just been replaced as head of the herd by an attractive herd-book Jersey recently introduced. For some years pure-bred Berkshire pigs have been kept, but Mr. Masters is now using a Large White boar of ideal type on his five Berkshire sows. Merino ewes of fair type are mated with Shropshire rams to produce fat lambs, the rams being of the very best of the breed. The Leghorn fowls, 200 in number, were all purchased from Parafield Poultry Station. Of other poultry, geese only are kept. Some tomatoes are sold each year, but this is the only form of sideline availed of other than livestock.

Because he has persisted in breeding pure-bred animals and has only used sires of good type and high quality, Mr. Masters is in the position of being ready to take advantage of the improved marketing facilities about to be provided for Eyre's Peninsula farmers, and his action in this direction is to be commended. All of his livestock are of good type and a credit to him.



Mr. H. C. Roediger has one of the nice homesteads of Yeelanna district.

Mr. H. C. Roediger, Yeelanna.—Although Mr. Roediger carries a lot of livestock on his farm his wheat growing and sheep flocks are so extensive that the sidelines only form a relatively small proportion of his farm activities. There are 20 cows in the milking herd, all being grade Shorthorns, but a young Jersey bull has been secured and he will soon be old enough to head the herd. Four half-bred Berkshire x Tamworth sows are used for breeding purposes, but are mated to a Berkshire boar of the old type. No attempt is being made to breed good fat lambs, but Corriedale rams have been mated to Merino ewes and the wether lambs are a great improvement on pure-bred Merinos. About 200 hens, comprised of Leghorns and Orpingtons, are kept, and are



A large field of King Island Melilot on the property of Mr H. Edwards, Streaky Bay, being converted into hay, estimated to yield over 1 ton to the acre.

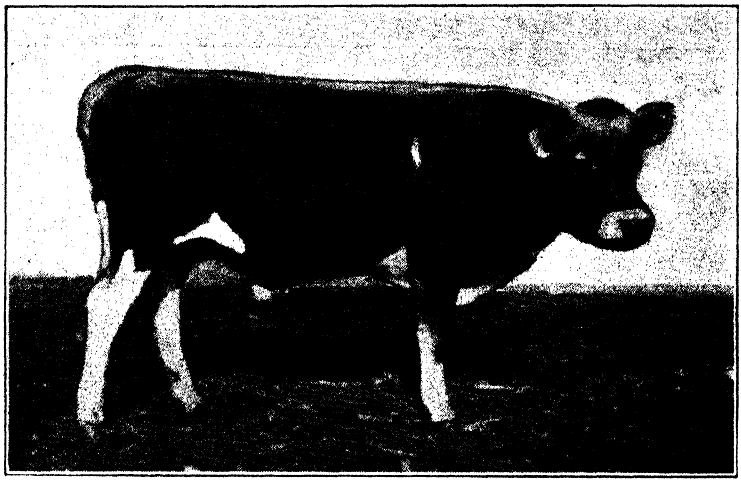
of quite fair type, the roosters used in the mating pens being pure-bred, but not from particularly good strains. Turkeys are the only other form of poultry kept, and of these there were 70 grown birds as well as numerous young ones. No other sidelines are produced and sold. A good dairy bull from high-production ancestors, a Large White boar of good modern type, and roosters of good laying strain would have a beneficial effect on the livestock of this farm.

A view of the homestead of Mr. H. Edwards, Streaky Bay.

Mr. W. Modra, Yeelanna.—Extensive crop growing and sheep carrying mean that the sidelines of Mr. Modra's farm form a relatively low proportion of his farming activities. The six cows in the milking herd are half-bred Jerseys of a useful type for milk production, but a noticeable improvement should take place with their progeny now that Mr. Modra has an attractive Jersey bull, by a subsidy bull out of a pure-bred cow. There are six half-bred Berkshire x Tamworth sows on the farm which are being bred to a Large White boar of fair type. A good Large White boar of modern type would produce first class bacon pigs from these sows. No fat lambs are being produced. About 100 barnyard fowls have the run of the farm, but fair quality Orpington

Mrs. W. Modra keeps her flower garden at Yeelanna in good order.

roosters are now being used to improve the flock. Other poultry consist of a couple of geese, a turkey, and a few Muscovy ducks. No other sidelines are produced for sale, although an extensive and attractive flower garden is maintained in excellent condition, and a fair collection of fruits and vegetables are well cared for.



Mr. F. Masters of Verran has recently introduced this attractive young Herd Book Jersey bull.

SIDELINES ON UPPER EYRE'S PENINSULA FARMS.

Side Lines.	Points Allotted.			
	Possible Points.	H. Edwards, Streaky Bay.	A. V. Preiss, Cleve.	F. J. Beinke, Kimba.
Proportion of farm activities	*	37½	23	27
Dairying—				
Cows—				
Breed	—	Grade Jersey	Jersey	Grade Shorthorn
Appearance for milk	50	35	35	28
Care	25	10	18	18
Number in milk	12½	12½	8	6
Suitability of type	12½	10	11	9
Purity	10	7	8	5
Bull—				
Breed	—	Jersey	Jersey	Jersey
Purity	20	20	20	14
Suitability of type	10	10	10	8
Care	10	7	8	9
Pigs—				
Breeding sows—				
Breed	—	Berk. and Mid. York.	Berk. and Mid. York.	Berk. and Berk. x Tam.
Suitability of type	25	17	17	17
Care	20	17	17	17
Number	15	7	6	7
Boar—				
Breed	—	Berkshire	—	Tamworth
Purity	10	8	—	8
Suitability of type	10	7	—	8
Care	5	4	—	4

SIDE LINES ON UPPER EYRE'S PENINSULA FARMS.—*continued.*

Side Lines.	Points Allotted.			
	Possible Points.	H. Edwards, Streaky Bay.	A. V. Preiss, Cleve.	E. J. Beinke, Kimba.
Pigs—*continued.*				
Young pigs—				
Suitability of type	8	5	5	6
Care	7	6	5	6
Crossbred lambs—				
Breed of ewes	—	Merino	10	
Type of ewes	20	10		
Breed of rams	—	Romney Marsh		10
Type of rams	20	8		
Care	10	7		
Poultry —				
Hens—				
Breed	—	Leghorn	Leghorn and Orpington	Leghorn and common
Suitability of type	15	13	12	8
Care of birds	15	10	9	11
Number of hens	15	10	11	7
Housing	8	5	5	5
Methods of marketing eggs	7	4	4	5
Roosters—				
Breed	—	Leghorn	Leghorn and Orpington	?
Purity	8	7	7	2
Suitability of type	7	6	6	2
Other kinds—				
Suitability of type	7	5	5	—
Care	8	4	6	—
Number of birds	10	5	4	—
Other side lines—	Max. 50			
Bees	—	—	—	—
Market gardens	—	7	—	7
Nursery stock	—	—	—	—
Other	—	—	—	—
Total points	—	321	270	254

* Proportion of farm activities—

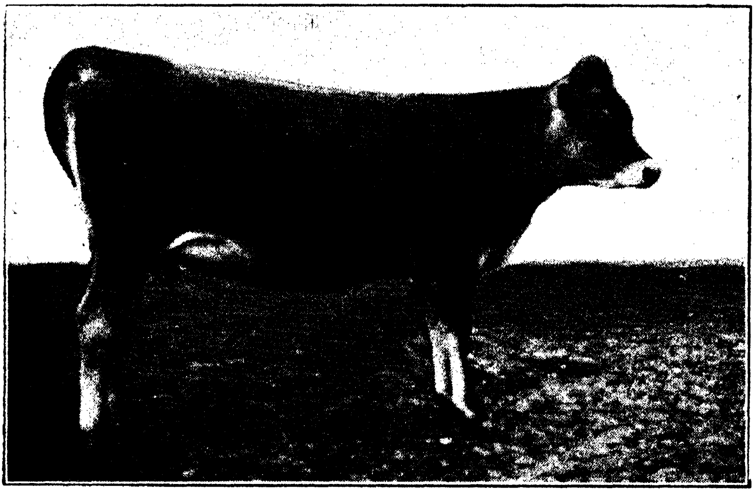
Sidelines, 10% (wheat and sheep 90%)	25 points
Sidelines, 15%	37½ "
Sidelines, 20% to 30%	50 "

THE ENTRIES IN UPPER EYRE'S PENINSULA.

H. Edwards, Streaky Bay.—Although Mr. Edwards has 30 cows in milk, these and his other animals remain a sideline because his crop growing and sheep raising activities are so extensive. The cows are good grade Jerseys, but at the time of inspection were looking rather rough-coated and hide-bound, due to some unexplained reason, and so it was difficult to estimate their milk yielding capacity. The Jersey bull now at the head of the herd is from one of the best herds in the State, and in all probability will greatly improve the stock. Three Berkshire sows and one Mid-York are used for breeding purposes, and are mated to a Berkshire boar. The fat lambs produced are from Merino ewes by a Romney Marsh ram. About 120 Leghorn hens are kept in a 3-acre yard enclosed with 6ft. netting. White Leghorn roosters are used in the mating pens. Five geese and a batch of goslings, as well as some half-bred Pekin x Rouen ducks are also kept. A little market garden stuff and some figs are sold each year.

A. V. Preiss, Cleve.—Because of the extent of his other farming activities, sidelines do not form a high proportion of Mr. Preiss' operations. Seven high-grade Jersey cows of good quality are regularly maintained, and the recent introduction of a young herd-book Jersey bull with aristocratic breeding should further improve the heifers. Two Mid-York sows and one Berkshire are kept, but at the moment no boar is on the property, which shortage will soon be overcome, as Mr. Preiss has arranged to introduce a Large White boar to mate with his sows. Corriedale rams of good type are being used on Merino ewes to eliminate wrinkles from the ewes so bred, and the wether lambs are better meat animals than the pure Merinos. About 150 White Leghorn and Black Orpington hens have the run of the farm, but five breeding pens of pure-bred birds are in use. White Runner ducks to the number of 20 are kept.

E. J. Beinke, Kimba.—Only five cows are regularly kept in Mr. Beinke's milking herd, the animals being grade Shorthorns, the progeny of which should be considerably improved by the attractive looking Jersey bull now being used. Two Berkshire and two Berkshire x Tamworth sows are used for breeding, the boar being a Tamworth of very fair quality. Three Lincoln rams and a Corriedale are used on Merino ewes, the wethers being sold as lambs, and the ewe lambs are being kept to develop into mothers of fat lambs. Only 65 hens of the barnyard type, although mainly of Leghorn blood, are kept, and no other kinds of poultry are reared. Some fruit and tomatoes are sold in season.



A well-grown Jersey heifer belonging to Mr. E. J. Beinke of Kimba

J. W. Bartram, Kimba.—Because of a tie in the original judging, Mr. Bartram's sidelines were also inspected, but under the existing method of farming being practised, with the considerably reduced area under wheat, and none of it on fallow, the sidelines constitute more than the maximum proportion of farming activities allowed by the donors.

GENERAL.

The competition has shown that some Eyre's Peninsula farmers are alive to the value of good breeding in their livestock, and on the other hand it has also revealed that many do not recognise that there is a difference between the well-bred and the mongrel. Certainly there has been little encouragement to breeders to make much effort to improve their animals, and the handicap of lack of marketing facilities and the enormous expense of introducing sires from Adelaide side is very great. Now that it is becoming possible to market most farm sidelines at Port Lincoln under reasonable conditions the position has altered, and more attention can be paid to improving the farm animals.

Jersey cattle are doing really well throughout the Peninsula, and as good Jersey bulls—subsidy and other—are readily obtainable in South Australia, the procuring of one of guaranteed breeding for milk production will mean the producing of heifers a good deal better than their mothers in most cases.

Part of the herd of grade Shorthorn cows maintained by Mr. H. C. Roediger of Yeelanna.

There are plenty of strong, high-backed, deep-bodied sows on the Peninsula capable of breeding ideal bacon pigs, and they will probably do it with most certainty if mated to Large White boars of the modern type.

Most of the English breeds of sheep will produce good fat-lambs from large-framed, deep-bodied Merino ewes, but for nearly all portions of the Peninsula best results are likely to follow the use of Southdown, Ryeland, Border Leicester, Dorset Horn, or Suffolk rams in the order named.

Minorca fowls lay large eggs of attractive shape, and are good fowls on a farm, as are also White Leghorns and Orpingtons, but where the latter breed is concerned sittings of eggs, chickens or cockerels should always be procured from strains that lay large eggs.

The first essential towards success in improving animals is to use good sires, and on no account should any but pure-bred sires ever be used on farms.

SAVE AND PROFIT.

Piling shillings one upon another may be a form of thrift, but it is a risky method—and unprofitable. There is loss of profit because the same money, placed in a Commonwealth Savings Account, would earn interest. There is risk of loss by fire, by burglary, even by inadvertence, and, not so obvious, but quite definite, there is the risk of temptation to spend.

The Savings Bank Account is the logical place for your savings, for there they both accumulate and earn interest. Thus your saving power is multiplied, your savings become profitable, and you are less tempted to spend wastefully.

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Commonwealth Savings Bank of Australia

GUARANTEED BY THE COMMONWEALTH GOVERNMENT.

REVIEW OF THE AGRICULTURAL SEASON.

[By E. Bromley, Divisional Meteorologist, Adelaide, South Australia.]

The weather experienced over practically the whole of the agricultural areas during the seven months (April to October) has been of a favorable nature, and prospects point to a bounteous and probably record harvest.

The partial break in the season which occurred towards the close of March was completed early in April. Widespread rains marked the passage of a disturbance of monsoonal origin which drifted across the State early in the month, while another deep cyclonic system in the second week brought further heavy falls. Two more rain storms occurred in the second half of April, the month being generally a wet and cold one, with heavy rainfall excesses over the greater part of the agricultural areas.

May, on the other hand, was for the most part fine and mild, due to anticyclonic control. Monsoonal influences, however, became active early in the second half of the month, bringing opportune rains.

Apart from light to moderate rain at the beginning of June the early part of that month was fine, with mild days but cold, frosty nights. Wintry conditions, however, definitely set in on the 11th, when a well-placed disturbance yielded probably the best rain for the season. During the next fortnight an almost unbroken succession of low pressure waves brought daily rain of a light to moderate character, and a continuance of cold, cloudy, and squally weather. The latter part of the month was, however, fine with some very cold, frosty nights.

Except for brief fine intervals, July was unsettled with frequent rain, but the falls were chiefly light to moderate in character, and the totals somewhat below the average in Western and Upper North Districts.

More good rains took place in August, particularly during the first half, which was unsettled as the result of two energetic disturbances. A cold snap with some snow occurred at the middle of the month, followed by a week's fine weather with many frosts and fogs.

Chiefly as a result of monsoonal influences, which were most persistent, further useful rains fell in September, except over the Upper Murray and adjacent districts. Owing to the absence of energetic southern "lows" there were few strong winds, and at Adelaide it was the calmest September on record.

Tropical depressions, which at times developed cyclonic formation, were also active in October, and in consequence the weather was very cool, cloudy, and unsettled, with frequent rain accompanied by many thunderstorms. Taken on the whole the month's rainfall was slightly above normal, but in the Upper Murray the registrations were again only light.

"ABOVE AVERAGE RAINS."

With a few isolated exceptions the total rainfall for the seven months (April to October) was above the average throughout the agricultural areas, the surplus in the majority of cases ranging from 2in. to 5in. A few places, however, west of Spencer Gulf and in the Lower Murray and South Coast received more than 6in. above average —Tailem Bend 893 points in excess. On the Mount Lofty Ranges also there were several heavy departures from normal, the total of 3,986 points at Mount Barker being 1,437 points above, while Uraidla, with 4,821 points, showed a surplus of 1,224 points.

Apart from the Upper Murray, where the total rain was practically the same as last year, all districts showed an improvement on the 1931 rainfall, the increase ranging from 1in. to 3in.

The following table gives the total rain at representative stations during the seven months (April to October) compared with 1931, and the average.

Total Rain, April to October—100 *Points* = 1*in.*

Station.	1931.	1932.	Average.
Blinman	7·53	7·65	7·75
Hawker	13·88	8·89	8·80
Quorn	8·53	9·84	9·81
Carrieton	9·12	9·11	8·60
Orroroo	10·18	11·76	9·19
Terowie	8·97	11·95	9·24
Jamestown	12·56	15·16	13·39
Laura	11·53	17·36	13·77
Port Germein	9·35	13·47	8·98
Crystal Brook	12·46	14·10	12·02
Redhill	13·57	16·63	12·92
Snowtown	14·62	15·92	12·20
Clare	19·78	22·18	19·39
Kooringa	14·82	16·51	13·70
Gawler	14·81	16·51	14·70
Adelaide	18·91	21·36	16·50
Eudunda	13·71	16·59	12·96
Truro	15·36	15·65	15·54
Sutherlands	9·60	9·95	7·81
Morgan	7·09	6·94	6·20
Loxton	8·09	8·98	7·71
Callington	10·14	14·07	11·41
Strathalbyn	15·28	15·66	14·93
Willunga	28·22	24·36	21·06
Maitland	16·24	20·51	15·99
Minlaton	14·67	17·71	14·41
Fowler's Bay	12·56	15·03	9·57
Streaky Bay	13·91	15·07	12·33
Port Lincoln	15·41	22·21	15·93
Darke's Peak	13·65	17·24	11·55
Port Elliot	15·24	18·00	15·61
Lameroo	11·46	12·25	12·03
Bordertown	12·21	13·77	14·71
Naracoorte	17·00	18·48	17·56
Robe	20·42	22·61	20·02
Mount Gambier	17·29	23·98	23·35

KYBYBOLITE FARMERS' DAY.

All previous attendances at the annual Farmers' Field Day at the Kybybolite Experimental Farm were eclipsed at the 1932 gathering held on November 9th, when over 400 people, including delegates from most of the Branches of the Agricultural Bureaux in the South-East, and visitors including several car loads from across the border under the guidance of the Manager (Mr. L. J. Cook), inspected the various experimental plots and livestock. Lecturettes were given by Messrs. L. J. Cook, R. C. Scott, H. B. Barlow, O. H. Gepp, and H. C. Trumble. Messrs. S. Shepherd and P. J. Baily attended on behalf of the Advisory Board of Agriculture. After luncheon Hon. S. R. Whitford, M.L.C. (Minister of Agriculture), and Professor A. J. Perkins (Director) addressed the gathering, and life membership certificates of the Agricultural Bureau were presented to Messrs. C. O. Hahn and E. Schinckel by the Minister. The following resolutions were carried.—"That the Department of Agriculture be requested to arrange for an interchange of judges in Crop Competitions." "That a resident veterinary surgeon be stationed in the South-East."

It was also decided that a Conference be held in each of the northern and southern ends of the South-East and that the next Conference for the lower division would be held at Penola, with the arrangements in the hands of the Penola Women's Branch. Mr. W. H. Downes (District Dairy Instructor) addressed the special session which was held for women on "Butter Making on the Farm," and Mrs. Kidman (Penola) gave a demonstration of the uses of citrus fruits.

SEED WHEAT FROM COMPETITIONS.

In Wheat Crop Competitions conducted in the undermentioned districts, the following competitors exhibited crops which, in the opinion of the judges, will produce grain suitable for seed purposes:—

District. Competitor. Address. Variety.

- WESTERN—
  - F. N. Young, Warnertown—Ford and Greig's Selected.
  - L. C. Roberts, Port Pirie—Currawa.
- ALFRED—
  - O. E. Klau, New Residence—Ki (Selection Late Gluyas).
  - G. J. Zimmermann, Meribah—Ki (Selection Late Gluyas).
  - A. C. Webb, Paruna—Nabawa and Gallipoli.
  - E. M. Edwards, Paruna—Ranee.
  - W. Paull & Sons, Alawoona—Nabawa.
  - B. L. Finey, Alawoona—Nabawa.
- ALBERT—
  - E. J. Marrett, Wanbi—Bald Early.
  - Rundle Bros., Caliph—Bald Early.
- RUSSELL AND BUCCLEUCH—
  - Sanders Bros., Karoonda—Nabawa and Sword.
- CENTRAL—
  - J. Eden, Sheaoak Log—Waratah.
  - G. Hienjus & Son, Sheaoak Log—Daphne.
  - J. R. Smith, Smithfield—Federation.
  - W. A. Roediger, Gawler River—Ford and Sword.
  - A. M. Dawkins, Gawler River—Ford.
  - E. Day, Wasleys—Sword.
  - R. Perry, Wasleys—Sword.
  - B. Buckby, Wasleys—Sword.
  - Currie Bros., Wasleys—Sword.
  - M. H. Richter, Wasleys—Sword.
  - L. W. George, Wasleys—Sword.
  - J. P. Carrigg, Hamley Bridge—Sword.
- SOUTHERN—
  - C. Brook, Woodchester—Nugget.
  - H. H. Cross, Woodchester—Nugget.
  - H. S. Stanton, Hartley—Nabawa.
  - E. T. & L. Jaensch, Hartley—Nabawa.
  - J. F. C. Paech, Hartley—Nabawa.
  - A. R. Strauss, Monarto South—Currawa.
  - Thomas Bros., Monarto South—Nabawa.
  - A. P. Braendler, Monarto South—Currawa.
  - C. F. Altmann, Monarto South—Sultan.
- FRAYVILLE—
  - C. A. G. Faehrmann, Mannum—Nabawa.
  - J. O. Bottroff, Palmer—Nabawa.
  - I. H. Wachtel, Palmer—Nabawa.
- BUXTON—
  - C. G. & G. W. Cant, Kimba—Waratah.
  - R. B. Cant, Kimba—Waratah.
  - C. C. Sutton, Kimba—Early Gluyas.
- FAR NORTHERN—
  - B. Koch, Morchard—Ranee.
  - H. G. Kupke, Morchard—Free Gallipoli.
  - A. J. Twigden, Morchard—Sultan.
  - E. H. Hampel, Wilmington—Onas.
  - J. Scriven, Orroroo—Waratah.
  - T. A. Brown, Eurelia—Queen Fan and Waratah.

SEED WHEAT COMPETITIONS—*continued.*

District. Competitor. Address. Variety.

NORTHERN YORKE'S PENINSULA—
G. E. and H. M. Meier, Paskeville—Sword.
S. G. Chynoweth, Boor's Plains—Waratah.
T. Stanway, Boor's Plains—Waratah.
N. Cross, Boor's Plains—Waratah.
C. and E. Yelland, Cunliffe—Waratah.
T. Rodda, Thrington—Waratah.
J. H. Bussenchutt, Paskeville—Waratah.
J. L. Bussenchutt, Paskeville—Waratah.
M. Yelland, Cunliffe—Dahpne.
C. Rodda, Thrington—Sword.
M. H. Lamming, Paskeville—Aussie.
D. G. Harris, Paskeville—D.G.H.

BALAKLAVA—
F. W. Sorrell, Barabba—Ford.
D. J. Wilson, Barabba—Ford.
O. L. Wilson, Barabba—Ford.
Harkness Bros., Owen—Ford, Waratah, and Sword.
L. C. Mills, Balaklava—Waratah.
O. L. Wilson, Barabba—Waratah.
R. H. Shepherd, Balaklava—Nabawa.
Bowyer Bros., Owen—Nabawa.
S. Hall, Owen—Nabawa.
J. H. Campbell, Barabba—Sword.

MID NORTH—
Catford Bros., Hoyleton—Sword.
A. Maitland, Rochester—Nabawa.
F. J. Pedler, Koolunga—Sword.
H. E. Weckert, Koolunga—Sword.
E. D. Whitehorn, Koolunga—Sword.
E. H. Bentley, Koolunga—Sword.
A. A. Bentley, Redhill—Sword, Waratah.
A. S. Kirk, Clement's Gap—Ford.
A. P. Kirchner, Redhill—Ford.
R. H. Badman, Yacka—Sword.
Higgins Bros., Georgetown—Nabawa.
Mrs. J. A. Lyons, Georgetown—Ford.
E. Smart, Gulnare—Nabawa.

MID YORKE PENINSULA—
J. C. Arnold, South Kilkerran—Nabawa.
S. W. Heinrich, South Kilkerran—Geeralying.
O. H. Heinrich, South Kilkerran—Geeralying.
R. E. Hasting, South Kilkerran—Dan.

LE HUNTE—
S. C. Billinghurst, Minnipa—Felix.
D. V. Kitto, Minnipa—Bena.
G. Williams, Minnipa—Late Gluyas.

CHANDOS—
H. E. Angel, Pinnaroo—Gallipoli.
J. H. and C. H. Spratt, Lameroo—Gallipoli, Felix, Waratah, and Sultan.
C. E. Koch, Lameroo—Sultan.
P. Ross, Parrakie—Gallipoli.

NORTHERN—
J. C. Kleinig, Laura—Nabawa.
C. Jaeschke, Wirrabara—Nabawa.
P. Curtin, Beetaloo Valley—Nabawa
F. G. Bartrum, Beetaloo Valley—Waratah.
W. D. Pearce, Gladstone—Ford.
J. J. Gale & Sons, Gladstone—Sword.
N. E. Coe, Gladstone—Dan.
J. S. Gillis, Gladstone—Sultan, Waratah.

SEED WHEAT COMPETITIONS—*continued.*

District. Competitor. Address. Variety.

NORTHERN—*Continued.*

W. M. Neate, Caltowie—Nabawa.
R. W. Batten, Caltowie—German Wonder.
J. E. Lehmann, Caltowie—Free Gallipoli.
R. W. Pearson, Jamestown—Nabawa.

MIDLANDS—

F. D. Lake, Alma—Barunga.
W. H. Brown, Alma—Sword.
F. G. Hannaford, Riverton—Sword.
A. R. Bagshaw, Saddleworth—Nabawa.
G. Hazel, Kapunda—Nugget.
P. McD. Smythe, Salter's Springs—Waratah, Ford.
Mrs. M. Glynn, Riverton—Currawa, Waratah.
C. H. Behn, Riverton—Waratah.
R. W. and L. G. Blatchford, Wirrilla—Waratah.
J. S. Lake, Salter's Springs—Ford.
L. V. Bell, Marrabel—Ranee.
F. Coleman, Saddleworth—Ranee, Gallipoli.
E. Pleuckhahn, Saddleworth—Pleuckhahn's Selection.
R. F. Kelly, Manoora; Pleuckhahn's Selection.
Frost Bros., Manoora—Gallipoli.
J. Jones, Manoora—Gallipoli.
W. R. Woods & Sons, Wirrilla—Gallipoli.
G. Ashby, Farrell's Flat—Gallipoli.
P. Kean, Farrell's Flat—Gallipoli.
T. Vogt, Saddleworth—Gallipoli.
L. W. Frost, Saddleworth—Dan.
G. Miller, Farrell's Flat—Bena.

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.		Average Test.
			Per Herd during October.	Per Cow during October.	Per Herd during October.	Per Cow during October.	
			Lbs.	Lbs.	Lbs.	Lbs.	%
5/C	33	31·55	28,124½	852·26	1,412·64	42·81	5·02
5/D	32	31	26,164	817·62	1,434·21	44·82	5·48
5/E	40·77	37·13	29,482	723·13	1,635·78	40·12	5·55
5/P	32	28·84	23,163½	723·86	1,193·70	37·30	5·15
5/R	60·03	53·23	38,006½	633·12	1,491·99	24·85	3·98
5/S	21·23	21	13,934½	656·35	735·24	34·63	5·28
5/Y	27·26	24·77	18,467½	677·46	974·68	35·75	5·28
5/Z	34·29	33·19	26,603½	775·84	1,312·67	38·28	4·93
5/Ee	18	18	18,491½	1,027·31	884·82	49·16	4·78
5/Ii	31	27·13	22,212½	716·53	1,090·56	35·18	4·91
5/Jj	25·74	24·35	24,774	962·47	1,070·00	41·57	4·32
5/Kk	20·84	16·94	12,875	617·80	630·68	30·26	4·90
5/Nn	26·23	25·06	24,539	935·53	1,184·74	45·17	4·83
5/Oo	20	19	17,360	868·00	810·75	40·54	4·67
5/Qq	18	14·39	8,109	450·50	497·48	27·64	6·13
5/Rr	22	21	13,066½	593·93	767·47	34·89	5·87
5/Ss	16·35	15·23	12,154	743·36	539·23	32·98	4·44
5/Tt	9·26	9·10	8,943½	965·82	476·01	51·40	5·32
5/Uu	23	20·48	14,553½	632·76	674·20	29·31	4·63
5/Vv	22	22	20,723½	941·98	899·16	40·87	4·34
5/Gg	22	17·06	10,684	485·63	530·58	24·12	4·97
Means	26·43	24·31	19,639·62	748·12	964·12	36·48	4·91

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR SEPTEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Sept.	Per Cow during Sept.	Per Cow July to Sept.	Per Herd during Sept.	Per Cow during Sept.	Per Cow July to Sept.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E ...	23·20	14	11,342	488·88	1,440·11	466·42	20·10	59·10	4·11
7/H ...	8·53	8·13	6,664	781·24	2.049·52	336·49	39·45	104·08	5·05
7/K ...	20	17·97	15,229	761·45	2,673·08	619·15	30·96	108·99	4·07
7/L ...	33·40	26·30	23,680	708·98	1,868·39	1,186·38	35·52	94·42	5·01
7/T ...	13·47	12·80	10,356	768·82	1,470·55	460·66	34·20	65·01	4·45
7/W ..	18·63	17	15,174½	814·52	1,966·42	618·97	33·22	82·17	4·08
7/Y ...	22	16·10	13,180	599·09	1,802·36	617·37	28·06	85·32	4·68
7/AA ..	14	11	6,810	486·43	1,269·39	364·70	26·05	67·13	5·36
7/HH .	15·87	10·57	9,019	586·79	1,372·13	401·62	26·13	61·75	4·45
7/KK .	25·53	18·30	16,994½	665·66	1,847·75	729·34	28·57	78·96	4·29
7/LL ..	13	7·03	4,422	340·15	1,221·47	166·12	12·78	49·89	3·76
7/MM .	37	34·23	32,907½	889·39	2,603·18	1,211·63	32·75	98·33	3·68
7/NN .	24	19·87	19,474	811·42	1,966·52	794·96	33·12	82·19	4·08
7/OO ..	15·70	13·27	10,891½	693·72	1,972·38	511·78	32·60	93·25	4·70
7/PP ..	14·53	12·60	11,042	759·94	1,995·67	639·16	43·99	112·72	5·79
7/QQ ..	13·77	9·10	5,958	432·68	1,350·94	351·63	25·54	79·45	5·90
7/TT ..	15·43	12·33	11,708	758·69	1,863·97	545·71	35·36	89·09	4·66
7/UU .	22	18·03	14,874	676·09	1,930·18	676·75	30·76	89·56	4·55
7/VV ..	12·97	12·33	12,454	961·01	2,335·75	617·69	47·65	121·22	4·97
7/WW .	16	14·50	13,710	856·87	1,859·05	684·33	42·77	93·63	4·99
7/XX .	15	15	12,960	864·00	2,502·23	725·76	48·39	138·32	5·60
7/YY .	14	11·43	8,283	591·64	1,308·56	349·87	24·99	57·87	4·22
7/ZZ ..	18	13·47	6,628	368·22	968·61	292·06	16·23	40·49	4·41
Means .	18·50	15·02	12,772·22	690·34	1,860·77	581·24	31·42	85·22	4·55

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during October.	Per Cow during October.	Per Cow December to October.	Per Herd during October.	Per Cow during October.	Per Cow December to October.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ...	20	18·55	17,874	893·70	6,032·66	776·99	38·85	268·98	4·35
6/C....	23·03	20·84	19,720	522·05	6,406·74	816·63	35·46	295·83	4·14
6/F ...	25	24	21,948	877·92	7,612·61	1,145·67	45·83	374·85	5·22
6/H ...	30·26	30·26	27,021	892·96	6,359·48	1,279·44	42·28	296·21	4·73
6/O ...	18	17	13,872½	770·69	5,983·91	753·56	41·86	314·96	5·43
6/X ...	19	16·77	9,968½	524·66	6,651·70	430·24	22·64	280·69	4·32
6/Y ...	22·68	14·87	8,561	377·47	4,659·39	364·11	16·05	206·02	4·25
6/EE ..	42	24·23	17·878	425·70	4,262·00	807·05	19·21	197·31	4·52
6/II ...	34·87	20·93	18,095½	518·94	5,793·81	768·46	22·04	264·46	4·25
6/KK .	19	17·42	12,753½	671·24	5,402·74	533·01	28·05	239·75	4·18
6/LL ..	23	15	11,129	483·87	5,687·40	426·90	18·56	233·09	3·84
6/OO ..	18	16·16	17,294	960·78	7,690·54	783·77	40·77	347·64	4·24
6/PP ..	16·35	13·32	11,254	688·32	6,811·55	530·53	32·45	330·72	4·71
6/QQ ..	28·55	22·48	22,313	781·54	7,291·89	891·33	31·22	321·28	3·99
6/RR ..	30·61	26·29	27,482½	897·82	7,350·88	1,108·04	36·20	314·44	4·03
6/TT ..	21·58	19·13	16,009	741·80	6,752·50	704·01	32·62	309·96	4·40
6/UU .	30·97	24·94	22,473½	725·65	5,980·80	877·58	28·34	256·03	3·90
6/VV ..	26·58	22·68	24,580	924·75	8,073·17	1,084·70	40·81	370·17	4·41
6/XX .	27·90	24·28	22,770½	820·99	6,846·96	986·86	35·58	302·15	4·33
6/YY .	29	25·26	17,475	602·59	5,978·90	889·50	30·67	304·08	5·09
6/ZZ ..	25·10	23·26	22,184	881·83	7,897·88	1,045·44	41·65	367·20	4·72
6/AAA .	21	20·45	16,215	772·14	4,663·90	789·88	37·61	240·64	4·87
6/A ...	19·97	18·71	16,571	829·79	Aug.-Oct. 2,311·49	780·84	39·10	Aug. Oct. 107·23	4·71
Means ..	24·89	20·73	18,060·54	725·64	6,323·31	805·41	32·36	288·92	4·46

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1—WHITE LEGHORNS.

Competitors.	Address.	Score to Month ending November 30th, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals.
Austwick, S.	West Marden	(1) 136	(2) 148	(3) 111	395
Barker, C. R.	Edwardstown	(4) 69	(5) 115	(6) *	184
Bolland, H.	Knoxville	(7) *	(8) 137	(9) 101	238
Butson, A.	Clarence Park	(10) 140	(11) 95	(12) 131	366
Carmichael, A. B.	Woodville West	(13) 100	(14) *	(15) *	100
Carroll & Leedham	Forest Gardens	(16) 66	(17) 133	(18) 136	335
Carter, W. A.	Glandore	(19) 117	(20) 135	(21) 93	345
Cleland, W. L.	Beaumont	(22) 122	(23) 123	(24) †	245
Cooke, B.	Kanmantoo	(25) 74	(26) 121	(27) 165	360
Cooper, Syd.	Edwardstown	(28) 117	(29) 104	(30) 116	337
Crawford, L. H.	Grange	(31) †	(32) 84	(33) 120	204
Crittenden, R. C.	Kilkenny North	(34) 132	(35) 171	(36) 170	473
Dawes, A. G.	Glenunga Gardens	(37) 163	(38) 123	(39) 142	428
Dawes, A. G.	Glenunga Gardens	(40) 104	(41) †	(42) ‡	104
Dawes, A. G.	Glenunga Gardens	(43) 156	(44) 114	(45) *	270
Dawes, A. G.	Glenunga Gardens	(46) 141	(47) 125	(48) 107	373
Dawes, A. G.	Glenunga Gardens	(49) 98	(50) 114	(51) 145	357
Dawes, A. G.	Glenunga Gardens	(52) 110	(53) 179	(54) 117	406
Dawes, A. G.	Glenunga Gardens	(55) 142	(56) 103	(57) 131	376
Duhring, T.	Mallala	(58) 105	(59) 117	(60) 132	354
Easther, Colin J.	Black Forest	(61) 148	(62) 111	(63) 154	413
Edgcumbe, J. L.	Plenty, Victoria	(64) 150	(65) 153	(66) *	303
Fidge, H.	Clarence Park	(67) 93	(68) 136	(69) *	229
Fox, Russell H.	Edwardstown	(70) 99	(71) 79	(72) 148	326
Gilbert, L. H.	Glanville Blocks	(73) 73	(74) *	(75) 124	197
Goldsmith, Keith	Kensington	(76) 152	(77) *	(78) *	152
Gore, A. G.	Summertown	(79) 159	(80) *	(81) 140	299
Gurr, A. & H.	Scott's Creek	(82) 94	(83) 146	(84) *	240
Hefford, H. H.	Murray Bridge	(85) *	(86) *	(87) 129	129
Hefford, H. H.	Murray Bridge	(88) 151	(89) 111	(90) *	262
Hillyer, Jas.	Kilkenny	(91) 126	(92) 148	(93) 149	423
Hodgson, W. H. A.	Salisbury	(94) 91	(95) 93	(96) 96	280
Lamerton, E. A.	Edwardstown	(97) 110	(98) 100	(99) *	210
Lindquist, E. F.	Semaphore Park	(100) *	(101) 149	(102) 150	299
Lindsay, Mrs. P. G.	Croydon	(103) 88	(104) 99	(105) ‡	187
Morris, H.	Seaton Park	(106) 126	(107) ‡	(108) 94	220
McPherson, K. R.	Blackwood	(109) ‡	(110) ‡	(111) 61	61
Nicholls, H. R.	Eden Hills	(112) *	(113) *	(114) ‡	—
Oliver, J. H.	Goodwood Park	(115) 114	(116) *	(117) *	114
Radbone, T. B.	Colonel Light Gdns.	(118) 118	(119) 110	(120) 128	356
Rassmussen, H. A.	Ethelton	(121) 137	(122) 100	(123) *	237
Woodbury Poultry Farm	Crafers	(124) *	(125) 41	(126) 119	160
Woodbury Poultry Farm	Crafers	(127) 124	(128) 149	(129) 143	416
Rowe, Bruce	Two Wells	(130) 156	(131) *	(132) 127	283

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitors.	Address.	Score to Month ending November 30th, 1932. Bird No. and Eggs Laid.	Score to Month ending November 30th, 1932. Bird No. and Eggs Laid.	Score to Month ending November 30th, 1932. Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 95	(134) ‡	(135) 147	242
Slape, W. C.	Magill	(136) 165	(137) 107	(138) 155	427
Thomas & Elson	Hawthorn	(139) 132	(140) 110	(141) 116	358
Thomas & Elson	Hawthorn	(142) 138	(143) 141	(144) 147	426
Vowels, C. C.	Westbourne Park	(145) 129	(146) 143	(147) *	272
Welford, F. F.	Colonel Light Gdns.	(148) 83	(149) 105	(150) 128	316
Urlwin, A. P.	Balaklava	(151) 105	(152) 122	(153) 117	344
Wiese, W.	Cabra	(154) †	(155) 94	(156) *	94
Wiese, W.	Cabra	(157) *	(158) *	(159) *	—
Williams, F. J.	Millswood Estate	(160) *	(161) 123	(162) *	123
Williams, W. R.	Frewville	(163) 121	(164) 136	(165) †	257
Williams, W. R.	Frewville	(166) 162	(167) 77	(168) 140	379
Woodley, W.	Tailem Bend	(169) 110	(170) 125	(171) 115	350
Connor, D. C.	Gawler	(172) ‡	(173) 143	(174) 132	275
Tolhurst, A. E.	Torrens Park	(175) 96	(176) *	(177) 119	215
Gurr, A. & H.	Scott's Creek	(202) *	(203) *	(204) 145	145
Totals		5,737	5,392	5,140	16,269

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

Gameau, V. F.	Woodville	(178) 82	(179) 110	(180) 99	291
Totals		82	110	99	291

Anconas.

Williams, W. R.	Frewville	(181) 89	(182) 90	(183) *	179
Totals		89	90	*	179

SECTION 3—BLACK ORPINGTONS.

Richardson, N. F.	Woodville	(184) 89	(185) 173	(186) 154	416
Cook, Arthur	Colonel Light Gdns.	(187) 158	(188) *	(189) ‡	158
Cooke, B.	Kanmantoo	(190) *	(191) *	(192) 115	115
Crago, Jack	Prospect	(193) 109	(194) 101	(195) ‡	210
Crawford, L. H.	Grange	(196) 153	(197) 108	(198) 104	365
Dowling, J. H.	Glossop	(199) *	(200) *	(201) *	—
Hudson, F. J.	Prospect	(205) 163	(206) 124	(207) *	287
Mills, H. J.	Edwardstown	(208) 116	(209) 153	(210) 180	449
Mills, H. J.	Edwardstown	(211) 99	(212) 194	(213) *	293
Rawe, J.	Seaton Park	(214) 170	(215) *	(216) *	170
Schubert, B. O.	Tanunda	(217) 79	(218) *	(219) 100	179
Frisby Smith, G.	Fulham	(220) 109	(221) 133	(222) 165	407
Twartz, H. L.	Gawler	(223) 149	(224) 134	(225) 151	434
Williams, W. R.	Frewville	(226) 164	(227) ‡	(228) 75	239
Williams, W. R.	Frewville	(229) 119	(230) 151	(231) *	270
Woodley, W.	Tailem Bend	(232) *	(233) 171	(234) 173	344
Totals		1,677	1,442	1,217	4,336

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Fidge, H.	Clarence Park	(235) 131	(236) 114	(237) 93	338
Gameau, V. F.	Woodville	(238) 159	(239) 106	(240) †	265
Williams, W. R.	Frewville	(241) 134	(242) 80	(243) 120	334
Totals		424	300	213	937

* Denotes disqualified under Rule 13. ‡ Denotes did not lay during July. † Dead.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE-TEST EGG LAYING COMPETITION, 1932-33.

[*Conducted at the Parafield Poultry Station under the supervision of the Department of Agriculture.*]

LEADING SCORES FOR WEEK ENDING DECEMBER 1ST, 1932.

SECTION 1—WHITE LEGHORNES.

Singles.	Scores.	Laid for Week.	Bird Nos.
A. G. Dawes	180	4	53
R. C. Crittenden	171	5	35
R. C. Crittenden	170	5	36
B. Cooke	166	5	27
W. C. Slape	165	5	136
Trios.			
R. C. Crittenden	473	—	34-36
A. G. Dawes	431	—	37-39
W. C. Slape	428	—	136-138
Thomas & Elson	427	—	142-144
Jas. Hillyer	426	—	91-93
Teams.			
A. G. Dawes	786	—	52-57
Thomas & Elson	787	—	139-144
A. G. Dawes	733	—	46-51

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

Singles.	Scores.	Laid for Week.	Bird Nos.
V. F. Gameau	111	5	179

Anconas.

W. R. Williams	91	5	182
W. R. Williams	89	3	181

SECTION 3—BLACK ORPINGTONS.

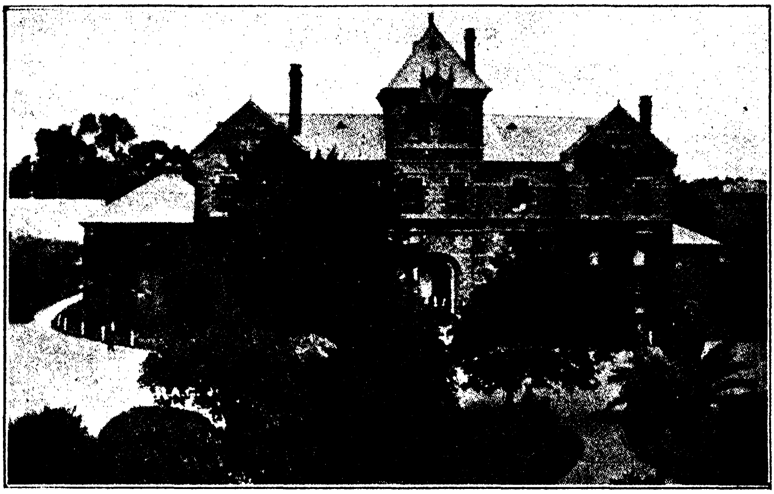
Singles.	Scores.	Laid for Week.	Bird Nos.
H. J. Mills	194	5	212
H. J. Mills	181	5	210
W. Woodley	174	5	234
N. F. Richardson	174	6	185
Trios.			
H. J. Mills	451	—	208-210
H. L. Twartz	436	—	223-225
N. F. Richardson	417	—	184-186
Teams.			
H. J. Mills	744	—	208-213

(5 birds competing.)

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Red.

Singles.	Scores.	Laid for Week.	Bird Nos.
V. F. Gameau	160	5	238
W. R. Williams	134	5	241
H. Fidge	131	2	235
W. R. Williams	120	4	243
Trios.			
H. Fidge	338	—	235-237
W. R. Williams	334	—	241-243



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RESULTS OF WHEAT CROP COMPETITIONS.

SEASON, 1932-33.

WESTERN DISTRICT.

Judged by Mr. E. L. ORCHARD (District Agricultural Instructor).

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
1	F. N. Young, Warnertown	Ford	32	24	18	12·5	3	89·5
2	L. C. Roberts, Port Pirie	Currawa	31	22	17·5	13	4	87·5
3	E. J. Eagle, Wandearah East	Nabawa	31	22	17	13	3	86
4	F. A. Johns, Pt. Pirie.	Quality	30	22	17	13	2·5	84·5
5	F. N. Young, Warnertown	Greig's Selected	30	21	17	13	3	84
6	E. J. O'Shaughnessy, Wandearah East	Nabawa	30	21·5	17	13	2	83·5
7	L. C. Crouch, Wandearah East	Nabawa	30	21	17	13	2	83
8	J. L. O'Shaughnessy, Wandearah East	Nabawa	29	20	17	13	3·5	82·5
9	F. A. Johns, Pt. Pirie.	Nabawa	31	20	16	12	3	82
10	H. Williams, Pt. Pirie	Nabawa	28	21·5	17	13	2	81·5
11	M. S. Ferme, Wandearah West	Early Gluyas	27·5	22	15	12	2·5	79
12	L. Davidson, Wandearah East	Nabawa	26	22	15	13	2·5	78·5
13	M. S. Ferme, Wandearah West	Nabawa	28	21	15	12	2·5	78·5

BUXTON.

Judged by Mr. H. D. ADAMS (District Agricultural Instructor).

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
1	C. G. and G. W. Cant, Kimba	Waratah	32	24½	19	14	5	94½
2	F. R. and L. O. Ferry, Kimba	Waratah	33	24	18½	13½	4½	93½
3	T. Hutchens, Kimba.	Nabawa	30	23½	19	13½	4	90
3	C. K. Wake, Pinkawillinie	Gluyas	30	24	18½	13½	4	90
3	R. B. Cant, Kimba	Waratah	29	24	18½	14	4½	90
6	F. Newman, Kimba	Gluyas	28	23½	18	13½	4	87
7	A. B. Atkinson, Pinkawillinie	Gluyas	27	22½	19	13	3½	85
7	J. Hannan, Kimba	Gluyas	27	24	17	13½	3½	85
9	H. A. Cant, Kimba	Gluyas	27	23	17½	13½	3½	84½
10	Leinert Bros., Pinkawillinie	Nabawa	26	23½	19½	10½	4	83½
10	E. J. Beinke, Kimba.	Gluyas	29	22½	15	13	4	83½
12	S. C. Johnson, Pinkawillinie	Felix, L. Gluyas	27	22	18	12	3½	82½
13	D. C. Cant, Pinkawillinie	Dan, Free Gallipoli, and Nabawa	25	22½	17½	13	3	81
14	F. G. Parson, Kimba.	Sword	24	21	19	13	3½	80½
14	T. E. Hudson, Pinkawillinie	Merriden	23	23	18	13	3½	80½
16	Ivan Grund, Kimba.	Merriden	24	21½	17	13	3½	79
17	H. C. Wake, Kimba.	Ranee	23	21½	17	11½	3½	76½
18	C. C. Sutton, Kimba	Gluyas	17	22½	18	14	4	75½

Results of Wheat Crop Competitions—continued.

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
	ALFRED DISTRICT.							
	Judged by Mr. R. L. Griffiths (District Agricultural Instructor).							
1	E. M. Edwards, Paruna	Ranee	31	24½	18½	14½	3	91½
2	G. J. Zimmermann, Meribah (1)	Gluyas and Nabawa	31	24	18	14	4	91
3	J. C. Auricht, Taldra	Gallipoli	31	23	17½	14	4½	90
4	W. Paull & Sons, Alawoona (2)	Nabawa	31	20½	19½	14½	4	89½
	G. J. Zimmermann, Meribah (2)	Gallipoli	30	24	17	14½	4	89½
6	W. Paull & Sons, Alawoona (1)	Caliph and Gallipoli	31	22½	18	14	3½	89
	A. C. Webb, Paruna	Nabawa and Gallipoli	29	23½	18½	14½	3½	89
8	O. E. Klau, New Residence	K.I.	27½	24	18½	14½	4	88½
	A. W. Traeger, Loxton (1)	Nabawa	31	23	17	13½	4	88½
10	A. W. Traeger, Loxton (2)	Waratah	30	23½	17	13	4½	88
	B. A. Altmann, Paruna	Nabawa	30	21½	18½	14½	3½	88
12	P. R. Hodge, Nangari	Nabawa	27½	23½	20	12½	4	87½
	F. A. Hondow, Paruna	Nabawa	29	22½	18	14	4	87½
14	E. A. Reichstein, Paruna	Nabawa	30	21	18	13½	4	86½
15	A. G. Petch, Meribah	Nabawa	27½	21½	19½	14	3½	86
16	R. J. Bain, Paruna	Nabawa	27½	24	16	14	4	85½
17	C. Nielsen, Meribah	Nabawa	27½	19	20	13½	4	84
18	A. S. Dart, Meribah	Nabawa	25	23½	18½	13½	3	83½
19	J. S. Crouch, Meribah	Nabawa	25	22½	18	13½	3½	82½
20	P. Harrip, Paruna	Dan	26	21	18	13½	3½	82
21	B. L. Finey, Alawoona	Nabawa	23	20	18	14½	2½	78
22	M. Shannon, Loxton	Silver Baart	22	21	17½	14	3	77½
	T. W. D. Willson, Alawoona	Rajah	24	20	17	14	2½	77½
	FAR NORTHERN							
	Judged by Mr. E. L. Orchard (District Agricultural Instructor).							
1	T. F. Orrock, Wepowie	Ranee	31	23	19	11	4	88
2	J. Scriven, Orroroo	Waratah	31	21	18	14	3·5	87·5
3	E. H. Hampel, Wilmington	Onas	32	22	17	13	3	87
4	Bert. Koch, Morchard	Ranee	30	22	19	13	2·5	86·5
5	A. J. Twigden, Morchard	Sultan	29	22	17	14	3	85
6	H. W. Noske, Wepowie	Joffre	29·5	20	19	12	3	83·5
7	T. A. Brown, Eurelia	Free Gallipoli, Waratah, and Queen Fan	29	21	19	12	2	83
8	H. G. Kupke, Morchard	Free Gallipoli	28	20	18	14	2·5	82·5
8	Bert. Koch, Morchard	Joffre	29	20	19	12	2·5	82·5
10	A. J. Polden, Eurelia	Nabawa	29	20	18	12	3	82
11	B. S. McCallum, Morchard	Ranee	27	21	19	12	2·5	81·5
12	J. F. W. Roocke, Wepowie	Sultan and Ranee	28	21	18	12	2	81
13	E. H. Schulz, Wilmington	Carpa and Hard Federation	29	21	17	10	3	80

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
	BALAKLAVA.							
	Judged by Mr. W. C. JOHNSTON (District Agricultural Instructor).							
1	F. W. Sorrell, Barabba	Ford	34	24	18	14	3	93
2	L. C. Mills, Balaklava	Waratah	33	24	18	14	3	92
3	Harkness Bros., Owen	Waratah	30	24	18	14	4·5	90·5
3	R. Shepherd, Balaklava	Nabawa	32	23	18	13·5	4	90·5
5	D. J. Wilson, Barabba	Ford	32	23	18	14	3	90
5	O. L. Wilson, Barabba	Waratah and Ford	34	22	18	13	3	90
7	A. J. Beare, Nantawarra	Ford	33	22	17	13	4	89
8	A. Webb, Saints	Sword	29	23	18	14	4	88
8	G. March, Owen	Ford	34	21	16	13	4	88
10	Harkness Bros., Owen	Ford and Waratah	31	22	18	13	3	87
11	H. Masters, Erith	Sword	29	23	17	14	3	86
11	Harkness Bros., Owen	Sword	29	23	18	13	3	86
13	J. A. Campbell, Barabba	Sword and Nabawa	28	23	18	13	3	85
14	G. Uppill, Balaklava	Ford	30	21	17	13	3	84
14	F. C. Cottle, Balaklava	Sword, Merriden, and Nabawa	29	23	18	11	3	84
14	H. Masters, Erith	Sword	26	24	17	14	3	84
17	S. Hall, Owen	Nabawa and Early Gluyas	26	22	18	14	3	83
17	Bowyer Bros., Owen	Nabawa	24	23	18	14	4	83
19	J. B. McPharlin, Owen	Crostan	26	22	16	12	3	79
	LE HUNTE.							
	Judged by Mr. W. H. BROWNRIGG (District Agricultural Instructor).							
1	S. C. Billinghurst, Minnipa	Felix	32	22	18	14	4½	90½
2	B. C. Black, Minnipa	Ford	33	23	15	13	4	88
3	A. W. Christian, Yaninee	Late Gluyas	33	21	15	13	4½	86½
4	J. Mitchell, Minnipa	Canberra	32	21	16	13	4	86
4	B. G. Heath, Pygery	Nabawa	33	21	17	11	4	86
6	D. V. Kitto, Minnipa	Bena	30	20	17	14	3½	84½
7	Crowther & McLean, Minnipa	Early Gluyas	30	22	16	13	3	84
8	F. L. Johnson, Wudinna	Nabawa	29	21	16	13	3½	82½
9	G. A. R. Scholz, Pinbong	Felix	27	22	18	12	3	82
10	G. Williams, Minnipa	Late Gluyas	27	22	14	14½	3	80½
11	G. Symonds, Pygery	Nabawa and Waratah	27	21	15	13	3½	79½
12	E. J. Barns, Wudinna	Nabawa and Caliph	29	19	15	10	4	77
13	T. L. Nottle, Minnipa	Early Gluyas	28	20	13	12	4	77
14	E. H. Edmonds, Pygery	Canberra	25	22	12	13½	3	75½
15	J. F. Heylen, Pygery	Nabawa and Gluyas	25	20	13	13	3	74
16	W. P. Bartley, Wudinna	Nabawa	27	16	11	13	2½	69½

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
	MID-NORTHERN.							
	Judged by Mr. E. L. ORCHARD (District Agricultural Instructor.)							
1	R. H. and W. O. Badman, Yacka	Sword	31	24·5	19·5	14	4·5	93·5
2	Mrs. J. A. Lyons, Georgetown	Ford	32	24	19	13·5	4	92·5
3	Catford Bros., Hoyleton	Sword	32	24	18	14	4	92
4	S. Perrin, Koolunga	Sword	31	22	19·5	14	5	91·5
5	E. Smart, Gulnare	Minister	33	24	17	12	4·5	90·5
6	James Hay, Yacka	Ford	33	23·5	19·5	10	4	90
6	E. H. Bentley, Koolunga	Sword	31	24	17	14	4	90
6	E. D. Whitehorn, Koolunga	Sword	31	24	17	14	4	90
9	E. Smart, Gulnare	Nabawa	32	24	18	13·5	2	89·5
10	E. S. Sheidow, Koolunga	Sword	30·5	24	18	12	4	88·5
11	A. E. Thomas, Crystal Brook	Ford	32	20	18	14	4	88
12	F. J. Pedler, Koolunga	Sword	29	23	19	14	2·5	87·5
12	A. A. Bentley, Redhill	Waratah and Sword	29	23	18·5	14	3	87·5
14	A. Maitland, Rochester	Nabawa	32	21	18	14	2	87
14	A. Maitland, Rochester	Ranee	33	22	18	12	2	87
16	H. E. Weckert, Koolunga	Sword	29·5	23	17·5	14	2·5	86·5
16	Higgins Bros., Georgetown	Sultan and Nabawa	31	22·5	16·5	14	2·5	86·5
18	A. P. Kirchner, Redhill	Ford	30	21	18	14	3	86
18	A. P. Kirchner, Redhill	Nabawa	30	21	19	14	2	86
20	A. S. Kirk, Clement's Gap	Ford and Daphne	30	20	19	14	2·5	85·5
20	M. Smart & Son, Gulnare	Aussie	32	21	18	12	2·5	85·5
	JERVOIS.							
	Judged by Mr. H. D. ADAMS (District Agricultural Instructor).							
1	H. F. Brine, Miltalie	Nabawa	26	23½	18½	13½	4	85½
2	F. and J. Leonard, Cleve	Waratah	25	24	18	13	4½	84½
3	F. L. Badman, Miltalie	Nabawa	26	23	18	13	4	84
4	A. Spriggs, Cleve	Gluyas	24	23½	17½	13½	4	82½
5	F. and J. Leonard, Cleve	Gluyas	23	23	17½	13	3½	80
6	H. E. Steinke, Cleve	Gluyas	22	23	17½	13	3½	79
7	D. O. McCallum, Rudall	Nabawa	20	23	17½	13½	3½	77½
8	S. Jacobs, Cowell	Nabawa	18	23½	18	13½	3½	76½
9	J. J. Deer, Cleve	Gluyas	17	23	18	13	3½	74½
9	F. W. Jericho, Cleve	Nabawa	18	23	17½	13	3	74½
11	Jacobs, Bert., Cowell	Withdrawn						
12	P. Storey, Cowell							
—	J. J. Deer, Cowell							
—	R. B. Deer, Cowell							
—	J. Brus & Sons, Mangalo							

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
	CENTRAL.							
	Judged by Mr. R. HILL (District Agricultural Instructor).							
1	J. P. Carrig, Hamley Bridge	Sword	34	24	19	14	4	95
2	H. J. Buckby, Wasleys	Sword	33	23	18	13·5	3·5	91
3	A. M. Dawkins, Gawler River	Ford	33	21	19	13·5	3·5	90
3	Currie Bros., Wasleys.	Sword	31	23	18	14	4	90
3	J. Eden, Sheoak Log .	Waratah	31	23	18	14	4	90
6	E. Day, Wasleys	Sword	30	23	19	14	3	89
7	W. K. Oliver, Wasleys	Nabawa	32	21	18	14	3	88
8	L. W. George, Wasleys	Sword	30	22	18	14	3	87
9	R. Perry, Wasleys....	Sword	29	22	18	14	3	86
	A. Sellick, Wasleys ..	Sword	32	22	15	14	3	86
9	Geo. Hienjus & Sons, Sheoak Log	Daphne	29	22	18	14	3	86
12	A. W. Roediger, Gawler River	Ford and Sword	29	22	18	13	3	85
13	M. H. Richter, Wasleys	Sword and Nabawa	27·5	22	16·5	13	3	82
14	J. R. Smith, Smithfield	Ford and Federation	29	19	17	13	3	81
15	V. M. Day, Wasleys .	Sword and Nabawa	27	20	17	13	3	80
16	H. Griffiths, Salisbury	Sepoy	24	21	17	11	3	76
17	H. Altmann, Sheoak Log	Nabawa and Dan	25	21	12	13	3	74
	NORTHERN YORKE'S PENINSULA.							
	Judged by Mr. W. C. JOHNSTON (District Agricultural Instructor).							
1	C. Yelland, Cunnliffe .	Waratah	34	24	19	14	4	95
2	G. E. and H. M. Meier, Paskeville	Sword	34	23	18	14	4	93
3	D. G. Harris, Paskeville	D.G.H. (Sel. Federation)	30	24	19	14	4	91
4	J. Lester Bussenschutt, Paskeville	Ford, Waratah, D.G.H.	33	22	18	13	4	90
4	A. J. McKay, Paskeville	Ford and Aussie	33	24	17	12	4	90
4	W. T. Correll, Kadina.	Ford	35	20	19	12	4	90
7	J. H. Bussenschutt, jun., Paskeville	Aussie and Waratah	29	23	18	13	4	87
8	M. H. Lamming, Paskeville	Aussie	28	23	18	13	4	86
8	T. Stanway, Boor's Plains	Waratah	27	23	18	14	4	86
10	Mrs. F. H. Bussenschutt, Paskeville	Merriden	29	21	16	14	4	84
10	S. G. Chynoweth, Boor's Plains	Waratah	28	22	18	13	3	84
12	T. Rodda, Thrington .	Waratah	26	23	18	13	3	83
12	M. Yelland, Cunnliffe	Nabawa and Daphne	27	22	18	13	3	83
14	E. Yelland, Cunnliffe .	Waratah	23	23	18	14	2	80
14	C. Rodda, Thrington .	Sword	23	23	17	14	3	80
14	T. Trengove, Bute ...	Nabawa	25	22	18	12	3	80
14	S. G. Chynoweth, Boor's Plains	Nabawa	26	22	16	13	3	80
18	G. Rodda, Thrington	Waratah	24	22	17	13	3	79
19	N. Cross, Boor's Plains	Waratah	24	21	17	13	3	78

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
	SOUTHERN. Judged by Mr. R. HILL (District Agricultural Instructor).							
1	H. H. Cross, Woodchester	Nugget	33	20	17	13·5	4	87·5
2	J. F. C. Paech, Callington	Nabawa	32	20	18	14	2	86
3	E. T. and L. Jaensch, Hartley	Nabawa	30	20	17	14	4	85
4	E. J. Jaensch, Hartley	Daphne	32	21	16	11	4·5	84·5
4	C. H. Zeunert, Monarto	Nugget	30	22	17	11	4·5	84·5
6	E. J. Jaensch, Hartley	Nabawa	28	19	18	12	3·5	80·5
7	A. P. Braendler, Monarto	Currawa	28	20	15	13·5	3	79·5
8	P. B. Frahn, Monarto.	Currawa	28	20	15	13	3	79
9	C. Brook, Woodchester	Nugget	27	18	16	14	3	78
10	A. R. Strauss, Monarto South	Currawa	25	20	15	14	3·5	77·5
11	E. T. and L. Jaensch, Hartley	Currawa	25	21	15	12	4	77
11	H. B. Wundersitz, Hartley	Nabawa and Currawa	27	19	16	12	3	77
13	H. S. Stanton, Hartley	Nabawa and Nugget	26	21	14	13	2·5	76·5
14	Thomas Bros., Monarto South	Nabawa	21	22	14	14	4	75
15	C. A. Whittlesea, Langhorne's Creek	Dan	20	20	17	13	3	73
16	C. F. Altmann, Monarto South	Nabawa	20	19	15	15	3	72
16	G. J. Hartmann, Monarto South	Nabawa and Currawa	24	18	16	11	3	72
18	C. Hassam, Hartley ..	Nabawa, Ford, and Waratah	25	19	14	10	3	71
19	C. A. Whittlesea, Langhorne's Creek	Free Gallipoli .	18	20	17	13	2·5	70·5
20	H. A. Eckert, Belvidere	Free Gallipoli and Major	24	18	14	11	3	70
20	B. Norman, Langhorne's Creek	Nabawa and King's	20	20	16	11	3	70
22	H. Hartmann, Monarto South	Nabawa	18	21	13	11	3·5	66·5
23	E. E. Liebelt, Monarto South	Nabawa	16	22	12	12	4	66
24	C. F. Altmann, Monarto South	Sultan	15	19	12	14	2·5	62·5
	ALBERT DISTRICT. Judged by Mr. R. L. GRIFFITHS (District Agricultural Instructor).							
1	H. Bird, Halidon.....	Nabawa	33	22½	17½	14	4	91
2	C. Shelton, Mindarie .	Ranee	31	23½	19	13	4	90½
3	C. H. Russell, Halidon	Nabawa	29	22	19	14	3½	87½
4	T. M. Vowles, Wanbi	Gallipoli	28	22	17½	13½	3½	84½
5	E. J. Marrett, Wanbi	Bald Early ...	26	21	18½	14½	4	84
6	A. E. Carslake, Kunlara	Sultan	26	22	17	14	4	83
7	Rundle Bros., Caliph .	Bald Early and Nabawa	23	21	19	14	3½	80½

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
		CHANDOS. Judged by Mr. R. L. GRIFFITHS (Agricultural Instructor, Murray Mallee District).						
1	J. H. and C. H. Spratt, Lameroo	Gallipoli	33	23	18½	14½	4	93
2	H. E. Angel, Pinnaroo	Gallipoli	30	23	18½	14½	4½	90½
3	Traeger Bros. (1), Pinnaroo	Nabawa	30	23½	18½	14	4	90
4	C. and L. Fisher (2), Pinnaroo	Begum	31	23	16½	14½	4½	89½
5	C. H. E. Hentschke, Lameroo	Ranee and Sepoy	31	23½	17	13½	4	89
6	J. A. Hamilton, Lameroo	Rajah	31	22	18½	13	4	88½
6	C. W. Blacksell, Pinnaroo	Gallipoli	30	23½	17	14	4	88½
8	P. J. McInerney, Pinnaroo	Waratah	28	22½	19½	14½	3½	88
8	A. J. A. Koch, Lameroo	Ranee	29	23	19	13	4	88
8	V. Polkinghorne, Geranium	German Wonder	32	22	16	14	4	88
11	C. E. Moyle, Parilla.	Ranee and Nabawa	28	22	19½	14	4	87½
11	C. H. Spratt, Lameroo	Waratah and Felix	29	22	19	14½	3	87½
11	G. Morris, Lameroo .	Ranee	31	22	18	13	3½	87½
11	F. H. Nickolls (2), Parrakie	Gluyas	29	23	17½	14	4	87½
15	H. F. Johnson, Parilla	Caliph	28	22½	19	14	3	86½
15	V. R. McDowell .... Geranium	Gallipoli	30	21½	18½	13½	3	86½
17	Traeger Bros. (2), Pinnaroo	Ranee	28	22½	18	13½	4	86
17	J. H. Spratt, Lameroo	Sultan	29	22	17½	14½	3	86
17	F. H. Nickolls (1), Parrakie	Gallipoli	28	23	17½	14	3½	86
20	Mattiske Bros. (1), Pinnaroo	Ranee and Gallipoli	28	22	18½	13½	3½	85½
20	Mattiske Bros. (2), Pinnaroo	Nabawa	26	23½	18½	14	3½	85½
20	J. L. Koch, Lameroo	Gallipoli	28	23	17	14	3½	85½
23	F. C. Webster, Pinnaroo	Ranee	27	21½	19½	13½	3½	85
23	O. R. Lang, Geranium	Gallipoli	28	22	17½	14½	3	85
25	D. A. Wurfel, Pinnaroo	Gallipoli	27	21½	19	14	3	84½
25	R. J. Billing, Pinnaroo	Gallipoli	27	21½	19	14	3	84½
25	C. H. Johnson, Parilla	Caliph, Gallipoli, and Ranee	27	21½	18½	13½	4	84½
28	C. and L. Fischer (1), Pinnaroo	Sultan and Gallipoli	28	22	17	13½	3½	84
28	A. Y. Knight (2), Geranium	Nugget	25	23½	18	14	3½	84
30	A. D. Sanderson, Parrakie	Gallipoli	23	23	20	14	3½	83½

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
	CHANDOS—*continued.*							
31	J. Hutchens, Parilla	Gallipoli	26	22	17½	14	3½	83
31	C. E. Koch, Lameroo	Sultan	26	23	16½	14½	3	83
33	L. D. White, Parrakie	Nabawa	26	22½	17	13½	3½	82½
34	A. Y. Knight (1), Geranium	Nabawa	24	21	19½	14½	3	82
35	R. F. Eylward, Jabuk	Gallipoli	23	22½	17½	14½	4	81½
35	F. H. Whittlesea, Jabuk	Ranee	23	23½	18	13½	3½	81½
37	P. Ross, Parrakie ..	Gallipoli	26	21	17	14½	2	80½
37	G. Andrews, Parilla.	Caliph	23	22½	17	14	4	80½
39	M. R. Fraser, Jabuk	Sultan	25	22	17	13	3	80
40	A. J. Beelitz, Parrakie	Gallipoli	24	21	16	14½	3	78½
41	G. A. McAllan, Jabuk	Joffre	18	23½	20	13	3½	78
41	R. C. Jacob, Geranium	Union and Nabawa	22	22	18	13	3	78
43	C. W. Neindorf, Parilla	Sepoy	22	22	16	13½	3½	77
44	E. Meagher, Panitya	Ranee	21	19	19½	13½	2½	75½
45	F. W. Gravestock, Parrakie	Late Gluyas ..	21	21	16	13	2½	73½
46	O. Heinzel, Parrakie.	Currawa and Walker's Wonder	21	20	16	13	2	72
	JUNIOR COMPETITION.							
1	C. G. Johnson, Parilla	Caliph	28	22½	19	14	3	86½
2	M. F. Hutchens, Parilla	Gallipoli	26	22	17½	14	3½	83
3	F. M. Brinkworth, Geranium	Gluyas and Nabawa	25	22	17	13½	3½	81
4	C. Jones, Parilla ...	Dan, Nabawa, and Ranee	25	19	17	13	3½	77½

The following entries withdrawn at judging time:—H. G. Fewings, Pinnaroo; Foale & Sons, Parilla; W. H. Cabot, Parrakie; L. S. Prouse, Geranium; F. Hughes, Geranium; Hardy Bros., Jabuk.

RUSSELL AND BUCCLEUCH.

Judged by Mr. R. L. GRIFFITHS (District Agricultural Instructor).

1	L. W. Clonan, Marama	Late Gluyas, Gallipoli	31	23	16½	13	4½	88
2	R. Sanders, Karoonda	Nabawa, Sword	27	23	18½	14½	4	87
3	A. H. Schloithe, Borrika	Gallipoli	29	22	18	13	3½	85½
4	Sanders Bros., Karoonda	Sword, Nabawa, Currawa	27	21	18½	14½	4	85
5	T. H. Quinn, Yurgo ..	Nabawa	27	21½	17	14	4	83½
6	G. R. Tregilgas, Yurgo	Bowes, Currawa	23	23½	18½	13½	4	82½
	Elliott Bros., Karoonda	Caliph	24	23½	17	14	4	82½
	J. Bullen, Yurgo	Nabawa	23	23	19½	13	4	82½
9	D. J. Walker, Perponda	Felix	23	23	15	14	3	78

RESULTS OF WHEAT CROP COMPETITIONS—continued.

NORTHERN DISTRICT.

Judged by Mr. E. L. ORCHARD (District Agricultural Instructor).

Position.	Name and Address.	Variety. Maxima—	Apparent Yield. 35	Freedom from Weeds. 25	Freedom from Disease. 20	Trueness to Type. 15	Evenness of Crop. 5	Total. 100
1	J. J. Gale & Sons, Gladstone	Sword	32	24	19·5	14	4·5	94
2	A. D. Bray, Belalie North	President	32	23	19·5	12	4·5	91
3	R. W. Pearson, Jamestown	Nabawa	31	24	19	14	2	90
4	P. Curtin, Beetaloo Valley	Nabawa	30·5	24	18·5	14	2·5	89·5
5	R. W. Batten, Caltowie	German Wonder Daphne	30	24	18	13	4	89
5	F. G. Bartrum, Beetaloo Valley	Waratah	29	24	19	14	3	89
5	N. E. Coe, Gladstone	Dan and Nabawa	30	23	19	14	3	89
8	Blesing Bros., Gladstone	Ford	33	20	17	14	4·5	88·5
9	W. D. Pearce, Gladstone	Ford	31	22	19	13	3	88
9	C. Jaeschke, Wirrabara	Nabawa	30	23	19	14	2	88
11	J. W. Prior, Gladstone	Free Gallipoli..	30	24	16	14	3·5	87·5
11	W. H. Adams, Caltowie	Waratah	30	22	19	13	3·5	87·5
13	J. C. Kleinig, Laura.	Nabawa	31	22	16	14	4	87
13	Amey Bros., Caltowie	Daphne	30	22	19	13	3	87
15	D. V. Blieschke, Murraytown	Ranee	31	22	18	12·5	3	86·5
15	J. S. Gillis, Gladstone	Waratah, Sultan, and Ranee	28	23	19	14	2·5	86·5
15	J. E. Lehmann, Caltowie	Free Gallipoli .	30·5	23	18	13	2	86·5
15	W. M. Neate, Caltowie	Nabawa	29·5	23	17	14	3	86·5
19	H. R. Lines, Laura .	Nabawa	30	22	18·5	12·5	3	86
20	C. H. Lines, jun., Gladstone	Sultan	30·5	21	18	13·5	2·5	85·5
21	H. Reichelt, Laura..	Nabawa	30	21	19	13	2	85
22	C. Jaeschke, Wirrabara	Ranee	29	22	18	13	2·5	84·5
22	N. W. Royal, Caltowie	Sultan	29	24	16	13	2·5	84·5
24	J. H. Sargent, Gladstone	Currawa	31	20	18	12	3	84
25	C. Amey, Laura	Daphne	30	19	18	13	2·5	82·5
26	I. J. and W. P. Slattery, Laura	Nabawa	27	22	17·5	12	2	80·5
27	W. Slattery, Laura .	Bena	27	20	17	11	3	78

RESULTS OF WHEAT CROP COMPETITIONS—continued.

MIDLANDS DISTRICT.

Judged by Mr. W. C. JOHNSTON (District Agricultural Instructor).

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
1	P. McD. Smythe, Salter's Springs	Ford	35	24	18	13	4	**94**
2	W. H. Brown, Alma .	Sword	34	24	18	14	3	**93**
3	W. R. Wood & Sons, Wirrilla	Gallipoli	34	24	18	13	3	**92**
4	W. Lee, Farrell's Flat	Gallipoli	33	22	18	13	4	**90**
4	Mrs. M. E. Glynn, Riverton	Waratah and Currawa	32	23	18	13	4	**90**
4	J. S. Lake, Salter's Springs	Ford	33	23	18	13	3	**90**
7	P. McD. Smythe, Salter's Springs	Waratah	30	23	18	14	4	**89**
7	H. Schunke, Manoora	Gallipoli	32	22	18	14	3	**89**
9	R. F. Kelly, Manoora	Pleuckhahn's .	31	23	18	13	3	**88**
9	T. Vogt, Saddleworth.	Ranee and Gallipoli	32	22	18	13	3	**88**
11	F. D. Lake, Alma ...	Baringa and Sword	28	24	18	13	3	**86**
11	C. H. J. Benn, Riverton	Nabawa and Waratah	29	23	19	12	3	**86**
13	G. Hazel, Kapunda .	Nugget and Gallipoli	27	24	18	13	3	**85**
14	F. Mahoney, Farrell's Flat	Clarence	27	23	19	12	3	**84**
14	F. G. Hannaford, Riverton	Sword and Nabawa	27	23	18	13	3	**84**
14	J. A. Jones, Manoora.	Gallipoli	30	20	18	13	3	**84**
17	R. McKenzie, Alma .	Sword	31	21	15	13	3	**83**
17	A. R. Bagshaw, Saddleworth	Dan and Nabawa	27	23	17	13	3	**83**
19	P. Keane, Farrell's Flat	Gallipoli	23	23	18	14	4	**82**
9	M. Buckley, Farrell's Flat	Federation	26	23	18	12	3	**82**
21	P. Reid, Farrell's Flat	Gallipoli	25	22	18	13	3	**81**
21	G. Millar, Farrell's Flat	Gallipoli	24	22	18	13	4	**81**
21	A. T. Hill, Tarlee ...	Waratah	24	22	18	14	3	**81**
21	R. W. and L. G. Blatchford, Wirrilla	Waratah	23	23	18	14	3	**81**
25	J. and D. Kelly, Giles Corner	Nabawa	25	20	18	13	4	**80**
25	F. Coleman, Saddleworth	Gallipoli	25	22	17	13	3	**80**
25	E. Pleuckhahn,	Pleuckhahn's ..	24	23	17	13	3	**80**
25	H. J. Torr, Farrell's Flat	Baldmin	26	22	17	13	2	**80**
25	L. A. Martin, Farrell's Flat	Baldmin	23	23	18	13	3	**80**
25	L. W. Frost, Saddleworth	Nabawa and Dan	23	23	18	13	3	**80**
25	D. L. Clarke, Tarlee .	Nabawa	23	23	18	13	3	**80**
32	Molineaux Bros., Tarlee	Sultan	23	23	16	14	3	**79**
32	Frost Bros., Manoora.	Gallipoli	22	23	18	14	2	**79**

RESULTS OF WHEAT CROP COMPETITIONS—continued.

MIDLANDS DISTRICT—*continued.*

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
34	S. Garrard, Farrell's Flat	Gallipoli	23	21	18	14	3	79
35	G. H. Pryzbella, Farrell's Flat	Gallipoli	26	20	17	13	2	78
35	G. Ashley, Farrell's Flat	Gallipoli	22	22	18	13	3	78
35	F. J. C. Freebairn, Alma	Waratah	23	21	18	14	2	78
35	L. V. Bell, Marrabel	Ranee	21	22	18	13	4	78
35	J. Ross, Mintaro	Wannon	22	22	18	13	3	78
35	G. H. Schulz, Tarlee	Nabawa	23	21	16	14	4	78
35	J. R. and E. Jones, Wirrilla	Gallipoli and Federation	25	21	17	12	3	78
35	R. W. Durdin, Buchanan	Sultan and Waratah	20	23	19	13	3	78
43	W. J. Armstrong, Buchanan	Ranee	23	21	17	12	3	76
44	W. McAuliffe, Buchanan	Ranee	21	22	16	13	3	75
45	E. J. Williams, Saddleworth	Ranee and Gallipoli	22	22	17	10	3	74

Withdrawn.—L. Thornby.

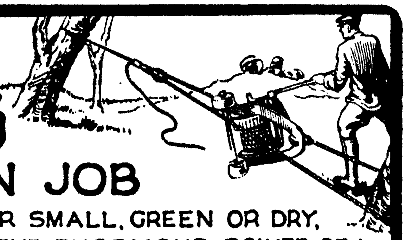
SOUTHERN YORKE PENINSULA.

Judged by Mr. R. HILL (District Agricultural Instructor).

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
1	Mrs. W. G. Boundy, Minlaton	Ford and Ranee	35	20	17	12	4·75	88·75
2	J. Boundy, Brentwood	Ranee	33	21	16	13	4·5	87·5
3	R. Tucker and Honnor and Sons, Brentwood	Ranee	34	20	16	13	4	87
4	R. H. May, Yorketown	Waratah	28	21	17	13	4·5	83·5
4	F. H. Tonkin, Minlaton	Daphne	30	23	15	11	4·5	83·5
6	A. M. Brook, Stansbury	Ford	31	20	17	12	3	83
6	W. G. Thompson, and Honner & Son Brentwood	Ranee and Currawa	32	20	16	12	3	83
8	S. & J. Darby, Brentwood	Nabawa, Sword, and Ranee	31	19	16	12	3	81
9	F. T. Slade, Yorketown	Nabawa and Sword	30	18	16	12	3·5	79·5
10	L. A. Slade, Weavers	Sword	26	21	17	11	4	79
11	A. P. Piggott, Weavers	Sword	30	15	17	11	3	76
12	Feehan Bros. and Honnor & Sons, Brentwood	Nabawa	28	15	15	13·5	3	74·5

RESULTS OF WHEAT CROP COMPETITIONS—continued.

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
	MID-YORKE'S PENINSULA.							
	Judged by Mr. R. HILL (District Agricultural Instructor).							
1	H. O. Linke, South Kilkerran	Ford	30	23	15	12	4	84
2	J. C. A. Arnold, South Kilkerran	Nabawa	27	20	18	14	4	83
3	O. H. Heinrich, South Kilkerran	Ford	30	18	17	13·5	4	82·5
3	O. H. Heinrich, South Kilkerran	Ford and Geeralying	28	21	17	13	3·5	82·5
5	J. A. H. Graefe, South Kilkerran	Ford	30	20	17	11	4	82
5	W. A. Heinrich, South Kilkerran	Dan	30	20	15	13	4	82
5	Henderson Bros., South Kilkerran	Ford	30	20	17	12	3	82
8	G. F. Pearce, Maitland	Ford	33	20	15	11	2·5	81·5
9	O. W. Arnold, South Kilkerran	Ford and Dan .	28	21	17	11·5	3	80·5
10	P. C. J. Marschall, South Kilkerran	Ford	30	20	15	12	3	80
11	O. B. Linke, South Kilkerran	Ford	30	20	15	11	2·5	78·5
12	S. W. A. Heinrich, South Kilkerran	Dan and Merriden	26	18	16	12	3·5	75·5
13	S. W. A. Heinrich, South Kilkerran	Nabawa and Geeralying	24	18	16	13	3	74
14	R. E. Hasting, South Kilkerran	Dan	24	15	17	14	2	72



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PAPERS READ AT CONFERENCES.

SOME OBSERVATIONS WITH REGARD TO THE CULTIVATION OF THE NON-IRRIGATED ORCHARD.

Paper read by Mr H. N. Wicks, Balhannah (Chairman Advisory Board of Agriculture), at the Conference of Non-Irrigated Branches, held at Tanunda on Tuesday, November 1st, 1932.

The cultivation of orchard lands in localities where irrigation is impracticable is one of the most important operations of the year, for not only is the quality of the fruit dependent upon the conservation of moisture by cultivation, but the actual yield in bushels can in a measure be controlled by systematic cultivation.

Treatment of Washaways.

In comparatively steep and undulating country the matter of washaways is one which causes some orchardists much concern, and is certainly a difficult problem in some soils, especially when the slope is facing the west. In the majority of cases the most economical method of control in this connection is by heavy manuring to induce an abundance of weed growth, the ideal being the growing of a cover crop of peas or beans throughout the winter months, the latter being the most suitable for the colder districts. Washing of a serious nature is generally caused by an accumulation of very small trickles and rivulets which, in undulating country may run diagonally across a slope, being led by furrows or cultivator marks until they converge in some depression when the quantity becomes too great to be held up by the small indentations and they break through and take the shortest course to the foot of the slope. If the ploughing of a slope which is subject to washing be undertaken up and down the slope, throwing on to every row of trees and leaving a slight depression caused by finishing every land in the centre, the danger of big washaways will be minimised, owing to the fact that each land takes its own complement of water. Although small washes may occur, there will not be any excessively large cuts such as occur by the accumulation mentioned earlier. If ploughing in this way is resorted to every third or fourth season, it will be quite safe to cross-plough by the usual method of off one row and on the next for a season or two before the depressions become flattened out sufficiently to permit convergence of the small trickles from row to row. It will be found that if the usual method is to plough up and down, using the off and on method, it will take several years before the necessity for ploughing away from the centres again becomes apparent.

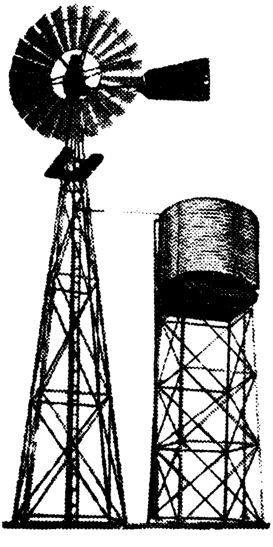
Cover crops offer some difficulty sometimes in getting them under, and if the weather becomes suddenly very dry the cover crop will pull so much moisture from the soil if not turned under promptly, as to make it a menace rather than a benefit. Get the cover crop in as early as possible, and as the prevention of washing is the chief aim in growing this crop, in this instance plough it under on the wet side rather than take a risk of the ground becoming too dry. Providing that a good mat of growth has resulted from the cover crop it will be found that even if turned under very early in spring and the ploughing is followed by heavy rains, washing will be negligible owing to the fact that the straw and rotting material from the crop will hold the soil. If this method is adopted the ground should not be harrowed immediately but left rough and cultivated later in the spring. Where it is impossible to prevent the collection of these small trickles, and in spite of preventive measures there are one or two lands which persistently collect enough surplus water to cause serious washing, the best plan is to leave such lands unploughed and get a covering of grass on them. If possible keep such washouts in one or two rows and leave them entirely alone so far as cultivation is concerned. If a good mat of grass can be induced on the surface, washing will be negligible, and such lands can be looked upon as permanent drains and treated as such.

THE VALUE OF THE TRACTOR IN THE ORCHARD.

The matter of implements is one which must be decided by the individual orchardist. Soil conditions will be the deciding factor in selecting the most suitable tools for this particular locality, but one implement worthy of special mention is the small tractor. It has been the firm belief of many people that only very large holdings can afford to utilise a tractor in an economical manner. This is a fallacy, in fact if it is a matter of cost of upkeep and maintenance—and these are, of course, the chief factors—then it is very often the large holding which will find the tractor the dearest method of working the land.

On a large holding with ample scope to grow plenty of fodder and plenty of paddocking room, the keeping of a team or two of horses all the year round is not a very serious or costly problem, but on the small holding with little or no paddocking this becomes a big problem both in fodder and in time. As an example, take an orchard of 20 acres which is capable of carrying a crop of 10,000 cases of fruit under ideal conditions. The value of this crop at the low figure of 2s. 6d. per case is well over £1,000. Let it be surmised that thrips are not troublesome and a perfect setting of fruit has eventuated. The land has been ploughed and harrowed into a fairly good condition with horses, and just at the critical juncture when the fruit needs it most, a deluge in the form of a thunder storm which supplies plenty of moisture is received. At the same time, however, it packs down the soil tightly. If this storm is followed by a heat wave of normal severity it will take more than two teams of horses to catch the soil before it loses the benefits of the extra irrigation. The soil is worse than before the storm in much less than a week.

It is not taking an extreme case when it is considered that by omitting to utilise this irrigation and keeping the land fit it is possible to reduce the value of the crop by at least one-third. In fact, apples in our district, which has over a 30in. rainfall, have



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become worthless from no other reason than this, and in some cases whole crops became unsaleable through being undersized. Assuming there is a crop valued at £1,250 at stake, and there is lost through inability to cultivate at the critical juncture one-third of the crop, in that season one will have lost outright two tractors. Offset against this, of course, one has the cost of the cultivation in question and the depreciation of the machine. As to cost of the work—cultivation being the matter in question—one can summarise the position thus: 1 acre per hour, 1gall. of kerosene per hour, for 20 hours and the job is done, and this is the main factor—the time in which the work can be completed. Headlamps can be fitted and the job run through without stopping for anything more than a few minutes for meals, and even these stops can be avoided if one or more drivers are available. I have in this way cultivated a 50-acre orchard in about 36 hours, during which time the tractor did not stop except for refuelling. It is this point which makes the tractor so valuable when an important crop is at stake, and so often the small orchard loses heavily owing to the slowness of horse cultivation.

Reverting to the matter of ploughing, whether done by tractor or horses, this must be completed before the soil becomes too hard, and in the non-irrigated areas there is no choice but to get at the job during the months of September and October. Just at this critical period the blossom buds are opening, the young fruit is being formed, and the tree needs all the vigor and food it is possible to collect for the immense task of setting the crop. If one examines the freshly turned soil from an orchard plough—which presumably will be ploughing in the vicinity of 4in. to 5in.—the amount of feeding roots which are turned up and broken from the tree is colossal. Just what effect on the actual setting of fruit this severance of the feeding elements of the tree has, it is hard to conjecture. Dr. Davidson, together with Mr. Evans, who are frequently in my orchard in connection with the thrips investigation, happened to come along one afternoon when a block of Jonathans—in the pink stage of blooming and showing for a wonderful crop—were being ploughed. A close examination of the soil was made, and the number of very fine hair roots visible was immense. On being asked what effect on the setting such a severance would have, Dr. Davidson's reply was that he could only surmise as to what the result might be, and thought the suggestion that a certain amount of experimenting might be valuable. Accordingly the block was left and will not be ploughed until the setting is finished. Investigation into this should not be a difficult problem.

Theoretically it would seem that to injure a tree hastens and accelerates its fruit bearing capacity and it seems to be a rule in Nature that when injured, trees and plants tend to reproduce themselves by the formation of seeds. On the other hand injury at this critical period when the tree is already exerting every effort to crop might have the reverse effect. Growers are so far in the dark in connection with this that some simple experiments should be undertaken.

CULTIVATION.

The popular belief is that if an orchard is not cultivated or neglected the root system comes nearer to the surface and the trees are much more subject to the vagaries of the weather. My experience in this connection is the opposite. The uncultivated trees often stand droughty conditions better than the cultivated ones, and as for the root systems coming to the surface, I feel sure that this is wrong; in fact reason points the other way. When ploughing to a normal depth in an orchard in early spring two things happen—the soil is warmed through aeration, and a quantity of humus, rotted leaves, and vegetation is turned under and mixed with the soil. Any manure which has been applied is contained in this top layer of warmed and finely tilled soil, and as a tree will make an enormous amount of root in a few weeks and is naturally looking for plant food, it would seem only reasonable to surmise that the root systems would revel in the ideal conditions offered them on the surface. On the other hand, the uncultivated orchard becomes packed and hard to a depth of several inches, and does not offer inducement for rapid root action owing to its earlier drying out in the spring, consequently the roots follow the moist and more congenial conditions lower down.

In some parts of the world present orchard practice is being sharply divided into two channels of thought with regard to this matter—the cultivated against the uncultivated or sod orchard as it is called. In the latter the only work done is to clip the grass for hay once or twice a year, and some of the yields from some of these orchards will equal anything put up by the cultivated ones. Were it not for the imminent and great danger of fire I would certainly try a block of trees this way, but in stringy bark country such as exists at Balhannah it matters not how many fire-breaks one may have, a spark may drift through the air for a mile or more, drop in the middle of a plot, and start a fire before anyone is aware of the danger. This would seem to preclude the practice from our particular district, but there are districts, no doubt, where orchardists would feel safe in trying out a plot under these conditions.

During the excessively dry season mentioned previously in this paper, it was very noticeable that trees which had not been cultivated for many years seemed to be less affected and certainly brought their fruit up better than trees which had been ploughed systematically for years and which were caught by the dry spell before the necessary cultivation was completed. Where the sod orchard would be safe from fires and could be brought to carry good crops it, of course, would be very profitable owing to the cheapened production costs, and such orchards would be more drought resistant than the cultivated ones in certain areas of assured rainfall.

CURRANT GROWING.

[*A paper on this subject was read at the Conference by Mr. W. H. Penna, Penwortham, and was published on page* 370 *of the October issue of the* Journal of Agriculture.—ED.]

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ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR DECEMBER.

[By CHAS H. BEAUMONT, District Horticultural Instructor.]

Harvesting soft fruits will be one of the main works of the month, and I must repeat what I have often said—keep the very ripe fruit for drying; keep the harder fruit in separate cases from that which is forward. The softer fruits should go in half cases. The best peaches should be packed in trays and be wrapped. A pamphlet is available for those who do not know how to go about drying.

Curculio beetle is getting troublesome again, and may be controlled with arsenate of lead—1lb. in 8galls. of water, sprayed where noticed.

Codlin moth must be kept in control, and the same old mixture gives the best results. Early apples should not be sprayed. White oils may be used later on with good results, but only use on dull days.

Root borers may be noticed on the foliage and may be picked off, or a spray as for curculio used. Cut worms can be stopped by the same treatment.

Lime sulphur may be used on dull days to clear the fusicladium, and it also lessens red spider. One gallon in 80galls. of water is the strongest that should be used.

Pear or cherry slug may be stopped by the same mixture as for codlin moth; it may be found on quite a number of shrubs other than fruit trees.

Strawberries may need irrigation and mulching.

Irrigate any trees, especially young trees, if any sign of wilting is noticed. Rub off all shoots not wanted, and keep soil loose and free from weeds.

Open up tomato houses and keep soil just moist through the day, but close up again at night.

Vines should be watched for oidium; sulphur dust is the remedy.

Keep the different varieties of almonds separate when gathering; sizing will also add to the value in the market.

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

NON-IRRIGATED FRUITGROWERS' BRANCHES CONFERENCE.

The Fifth Annual Conference of Branches of the Agricultural Bureau representing the Non-Irrigated Fruitgrowing Districts of the State, was held under the auspices of the Lone Pine Branch at Tanunda on November 1st. A good attendance of delegates was present from the Balhannah, Lone Pine, Light's Pass, Cherry Gardens, Penwortham, Greenock, Lyndoch, Angaston, and Blackwood Branches. Messrs. H. N. Wicks (Chairman Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), G. Quinn (Chief Horticultural Instructor), H. B. Barlow (Chief Dairy Instructor), C. McKenna, B.V.Sc., M.R.C.V.S. (Government Veterinary Officer), H. C. Pritchard (General Secretary, Agricultural Bureau), District Horticultural Instructors, and Dr. J. Davidson, D.Sc., F.E.S., and Mr. G. Samuel, M.Sc., of the Waite Research Institute, also attended.

Mr. H. N. Wicks delivered the opening address. The following papers were read and discussed:—"Frost Damage and a Scheme for Organising Combative Measures," K. Robinson (Angaston); "Some Observations on the Cultivation of a Non-Irrigated

Orchard,'' H. N. Wicks (Balhannah); ''Currant Growing in the Clare District,'' W. H. Penna (Penwortham). Conference carried the following resolutions:—''That this Conference deputes a delegate to convene a meeting of representatives of Barossa Valley Bureaux to form an executive to formulate a frost combating organisation.'' Mr. K. Robinson was appointed to convene the meeting. ''That cultivation tests be carried out at Blackwood Orchard to determine the effect of deep cultivation (4in. or 5in.) amongst apple and stone fruits at the time of blossoming.'' ''That a field day be arranged with Messrs. J. B. Harris and G. Samuel and the Branches in the Barossa District to inspect and take specimens of apricot trees affected with gumosis.'' ''That the Department of Agriculture be asked to convene a meeting of potato growers to discuss the certification of potato seed.'' ''That this Conference approach the Royal Agricultural and Horticultural Society with a request that the schedule of points in connection with the District Agricultural Bureau Exhibit at the Royal Show be reviewed to enable the Non-Irrigated Areas more scope for their chief products.'' At present 500 points are allotted for cereals and dry farm produce which cannot be produced in a number of non-irrigated districts. Fruit and fruit products are increasing in value to State and Commonwealth. ''That the place of the 1933 Conference should be decided upon by the Advisory Board.'' ''That the sizing gauge for export apples should be standardised and officially tested.'' ''As extensive research work has now proved that the polysulphides in lime sulphur sprays alone possess fungicidal and insecticidal values the Department of Agriculture be asked to have analyses made of the various brands of lime sulphur at present on the market, and that the polysulphide contents of such samples be published in the *Journal of Agriculture*, as is now done with arsenate of lead.''

Officers of the Department of Agriculture and Waite Agricultural Research Institute replied to numerous questions, and Conference concluded with an address ''Manuring in Relation to Fruit Trees and Vines,'' by Mr. G. Quinn (Chief Horticultural Instructor).

METROPOLITAN ABATTOIRS, ADELAIDE

MANUFACTURERS OF

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Read Report of Trials made by PROF. PERKINS,
Journal of Agriculture, January and July, 1921.

Meat Meal for Poultry

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The GENERAL MANAGER, Metropolitan Abattoirs Board,
Box 573E, G.P.O., Adelaide.

ALSO MANUFACTURED—

Blood Manure **Bone Manure**

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on November 30th, there being present:—Messrs. H. N. Wicks (Chairman), A. J. Cooke (Vice-Chairman), R. H. Martin, S. Shepherd, A. M. Dawkins, F. Coleman, G. Jeffrey, J. W. Sandford, A. L. McEwin, Prof. Perkins (Director of Agriculture), and H. C. Pritchard (Secretary). Apologies were received from Messrs. P. J. Baily and J. B. Murdoch.

Debt Adjustment.—On November 8th the Premier requested that a member of the Board be nominated for appointment to a committee to make a thorough investigation into the question of the adjustment of debts. The Chairman recommended that Mr. A. L. McEwin be appointed, and the recommendation was indorsed by the Board.

Non-Irrigated Fruitgrowers' Conference—Frost Control.—"That this Conference deputes a delegate to convene a meeting of representatives of Barossa Valley Bureaux to form an executive to formulate a frost combating organisation, and that Mr. K. Robinson be appointed to convene the meeting." Received.

Gummosis in Apricot Trees.—"That a field day be arranged with Messrs. J. B. Harris and G. Samuel and the Branches in the Barossa district to inspect and take specimens of apricot trees affected with gummosis." The Secretary reported that Messrs. Samuel and Harris were making arrangements to give effect to this resolution.

Place of Next Conference.—"That the place of the 1933 Conference should be decided upon by the Advisory Board." The Board decided to re-consider this resolution in April, 1933.

Agricultural Bureau Badge.—The Gladstone Women's Branch suggested that a badge for members of the Agricultural Bureaux might be procured. In order to obtain a representative opinion on this matter, the Board thought it advisable to bring the suggestion before the 1933 Annual Congress.

Branch Membership.—The Hanson Branch reported that a lady owner of stud cattle and Mid York pigs was desirous of becoming a member of the Branch. As there is no Women's Branch at Hanson the Branch asked for a ruling on the question of admitting ladies to membership of Men's Branches. It was decided to inform the Secretary of the Hanson Branch that on the recommendation of the Branch the lady would be admitted as a member failing the formation of a Women's Branch at Hanson.

Procedure at Annual Congress.—The Butler Branch submitted the following resolution:—"That the procedure of the Annual Congress be altered, the Free Parliament session to be extended and to take precedence of all papers." It was resolved to bring this resolution under the notice of the committee appointed to make arrangements for the 1933 Congress.

LIFE MEMBERS.—The names of Messrs. J. and G. Howard were added to the roll of life members of the Agricultural Bureau.

NEW BRANCHES.—Approval was given for the formation of new Branches at Coonawarra (Women's) and Rendelsham (Women's) with the following ladies as foundation members:—*Coonawarra*—Mesdames M. Redman, E. G. Alder, W. L. Redman, R. C. Lear, Misses O. Lear, J. Webber, R. Hinton, M. Reschke, G. Alder, E. Skinner, Mesdames J. Skinner, C. Teichelman, T. Worthington, R. Redman, E. Gaffney, J. Hinton, A. Reschke, W. Hoffman, A. Webber, O. M. Skinner, J. Kain, R. Modistach, D. Redman. *Rendelsham*—Mesdames S. Smith, F. Todd, sen., F. Todd, jun., W. Bignell, W. Inns, H. T. Sly, J. O'Toole, W. Andrews, F. R. White, Misses H. Sly, A. White, B. White.

Conditional approval was also granted for Branches at Karte and Mitcham.

NEW MEMBERS.—The following names were added to the rolls of existing Branches.—Warcowie—V. L. Sanders, R. F. Woodman, A. R. Bairstow; Jervois—L. Simms; Taragoro—M. Hamlyn; Mount Gambier—C. B. Mitchell; Greenock—A. Heinze; Millicent Women's—Mrs. J. A. Schulz; Belalie Women's—Mrs. Watkie, Mrs. D. Brookes, Sister McNeale; Penola Women's—Mrs. E. W. Stark, Mrs. McCalman; Kongorong—G. Lightbody; Waddikee Rocks—A. Moxon; Black Rock—J. Gearen, M. McMahon; Millicent—L. Watson; Wasleys Women's—Miss K. Skurray, Miss Allen, Mrs. F. Heading, Miss Joyce Heading; Goode—C. Lutze; Mangalo Women's—Mrs. H. S. Burton, Miss H. Hannemann; Parilla Women's—Miss E. Heinecke, Mrs. S. Palmer; Saddleworth Women's—Mrs. A. J. Marrett, Mrs. W. Ashton, Mrs. H. Huppatz; Mount Gambier—G. H. Dodgson; Narrung—S. Scott, H. A. Green, H. Bray, E. Dabinett; Roseworthy—John Eden, L. Heinjus, W. Shanahan; Mount Compass—A. M. Gregory; Balumbah Women's—Mrs. H. L. Van Heythusen, Mrs. R. C. Counsel, Mrs. A. Whitford; Frayville—Laurie Watchel, N. Watchel, S. A. Watchel, V. H. Dohnt, W. R. Pese, R. W. Lindner; Milang—R. J. Newland; Narrung—G. G. Hackett, J. A. Rohrlach, J. Thompson, G. Pfeiffer, H. Calf; Belvidere—Master Jim Collett; Mudamuckla—H. G. Dupree; Greenock—H. Atze, E. Atze, A. Krause; Wepowie—E. W. E. Paech, H. G. Scriven; Jamestown—R. B. Phillips; Myponga—J. R. Rowley, L. Kelsh, W. White, T. Grayham, W. A. Rowley; Wasleys Women's—Mrs. R. Evans; Roberts and Verran—R. D. Jonas; Hope Forest—John Inkster, Wm. McGee, D. Searle, A. Eves, D. Eves, M. Eves, G. Fisher, K. Bevan, S. Coad; Taragoro—J. Shaw; Goode—P. Box.

No. of new members, 80; No. of present members, 8,156; No. of Branches, 320.

Several items were dealt with in committee.

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IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., SEPTEMBER, 1932.

IMPORTS.

Interstate.

Apples (bushels)	129	Bulbs (packages)	48
Bananas (bushels)	11,704	Plants (packages)	63
Citrus—		Moss (packages)	2
Grape fruit (bushels)	3	Seeds (packages)	46
Lemons (bushels)	5	Trees, fruit (packages)	20
Oranges (bushels)	6	Wine casks (No.)	2,550
Passion fruit (bushels)	265	Cases, second-hand (No.)	121
Pineapples (bushels)	1,505		
Tomatoes (bushel)	1	*Fumigated*—	
Nuts—		Plants (package)	1
Mixed (bag)	1	Trees, fruit (packages)	6
Peanuts (bags)	397	Wine casks (No.)	37
Peanuts, kernels (bags)	29	Cases, second-hand (No.)	119
Beans (bushels)	14		
Cucumbers (bushels)	15	*Rejected*—	
Onions (bags)	268	Bananas (bushels)	3
Potatoes (bags)	2,743	Tomatoes (bushel)	1
Swedes (bag)	1	Cases, second-hand (No.)	2

OVERSEAS.

(State Law.)

Wine casks (No.)	545

Federal Quarantine Act.

	Packages.	lbs.		Packages.	lbs.
Seeds, &c.	2,098	318,552	Tea chests	1,637	—
Plants	5	33 (No.)	Timber	228,150	5,667,787 sup. ft.
Cocoanut chests	277	—			

EXPORTS.

Federal Commerce Act.

		Packages.			Packages.
England	Oranges	28	Singapore	Vegetables	67
South Africa	Plants	4	Netherlands, East Indies	Oranges	140
New Zealand	Seeds	20		Vegetables	24
India	Apples	40	Malay Peninsula	Vegetables	12
	Oranges	2		Potatoes	10
	Vegetables	8		Apples	10
Singapore	Lemons	10		Lemons	2

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on December 1st, 1932:—

BUTTER.—The supplies throughout November kept up well for this period of the year, and with the warmer weather experienced at the latter end, there was a distinct falling away in production. The hot spells also affected the quality of many consignments of cream and butter. Unfortunately, the London market throughout November was very depressed, and record low levels in prices were ruling. There has, however, since been a slight improvement, which is welcome after the long spell of dropping values. Choicest creamery fresh butter, in bulk, 1s. 0¼d.; prints and delivery extra (these prices are subject to the stabilisation levies); store and collectors', 6½d. to 7d. per lb. at store door, less usual selling charges.

EGGS.—The supplies of eggs are now decreasing somewhat, but this was only to be expected with the passing of the season and hot summer conditions setting in. There is a good local demand at present for selected fresh eggs, and some export is still being done, but, unfortunately, the quality of most consignments recently has been affected by the hot weather, and values eased. Ordinary country eggs, hen or duck, 4½d. per dozen; selected, tested, and infertile, higher.

CHEESE.—Record quantities of cheese are still being manufactured by the South-Eastern factories, as the feed conditions are still good, and the market supplies to the factories are keeping up better than in the northern parts of the State. Shipments are going forward each week to Britain, and the local and Western Australian trade continues up to average. New makes, large to loaf, 6½d. to 7d.; semi-matured and matured, 9d. to 11d. per lb.

Bacon.—The demand for bacon kept up well for this period of the year, and the turnover, generally speaking, was ahead of the corresponding period last year. An improved demand also for bacon factory small goods and hams was experienced, and the factories therefore have been kept busy coping with the demand. Turnover in Christmas hams has also shown an improvement on the turnover for several years past. Best local sides, 8½d. to 9d.; best local factory-cured middles, 8½d. to 9d.; large, 8d.; local rolls, 8½d. to 9d.; local hams (raw), 1s. to 1s. 1d. ; cooked, 1s. 2d. to 1s. 3d.; lard, prints, 6d. per lb.

Almonds.—Moderate supplies came forward each week from growers, and at times there were insufficient consignments to meet all demands. However, as buyers have now purchased sufficient for their Christmas requirements, demand is not quite so brisk, although there is a fairly steady sale for good quality lots. Brandis and softshells, 10d. to 10½d.; hardshells, 6d. to 6½d.; kernels, 2s. 2d. to 2s. 3d. per lb.

Honey.—Sales are only moderate for this commodity, and except for prime quality clear extracted, there is very little other call. Prime clear extracted, in liquid condition, 3d. to 3½d.; second grade, 2d. to 2½d. per lb.

Beeswax came forward in better quantities throughout November and sold readily, 1s. 0½d. to 1s. 1d. per lb., according to sample.

Live Poultry.—The demand for live poultry was well maintained throughout November, and supplies show considerable increase. A large proportion of the catalogue submitted, however, was only of the lighter breeds and old hens, and for these values eased somewhat. With buyers operating strongly for Christmas poultry, however, any lots of prime quality heavy weight young birds sold readily at satisfactory prices, and we anticipate that this demand will continue, but would strongly advise consignors to market their birds straight away rather than leave till closer up to the festive season. Prime roosters, 4s. to 5s.; nice conditioned cockerels, 2s. 9d. to 3s. 9d.; fair conditioned cockerels, 2s. to 2s. 8d.; chickens, lower; heavy weight hens, 2s. 9d. to 3s. 9d.; medium hens, 2s. to 2s. 7d.; light hens, 1s. 4d. to 1s. 9d.; couple of pens of weedy sorts lower; geese, 4s. to 6s.; goslings, lower; prime young Muscovy drakes, 4s. to 5s. 3d.; young Muscovy ducks, 2s. 3d. to 3s.; ordinary ducks, 1s. to 2s.; ducklings, lower; turkeys, good to prime condition, 8½d. to 10½d. per lb. live weight; turkeys, fair condition, 6½d. to 8d. per lb. live weight; turkeys, fattening sorts, lower; pigeons, 4d. to 6d. each.

Potatoes.—Old season's, 4s. 6d. per cwt.; W.A., new, 8s.; local, new, 8s. per cwt.

Onions.—New season's, 7s. per cwt.

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RAINFALL TABLE

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of, and to the end of November, 1932, also the average precipitation to the end of November, and the average annual rainfall.

Station.	For Nov., 1932.	To end Nov., 1932.	Av'ge to end Nov.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.				
Oodnadatta	0·13	3·93	4·30	4·75
Marree	1·40	7·55	5·16	5·93
Farina	0·54	6·87	5·89	6·48
Copley	0·35	7·11	7·18	7·95
Beltana	1·52	7·72	7·69	8·59
Blinman	1·26	9·74	12·11	12·00
Hookina	0·43	9·70	10·32	11·42
Hawker	0·87	12·77	11·37	11·42
Wilson	0·45	12·43	10·88	12·23
Gordon	0·06	9·21	9·78	10·69
Quorn	0·07	13·63	12·58	13·35
Port Augusta	0·07	12·02	8·83	9·42
Bruce	0·04	10·54	9·07	9·90
Hammond	—	13·44	10·51	11·33
Wilmington	0·04	17·00	16·64	17·50
Willowie	0·04	15·14	11·30	12·16
Melrose	0·09	28·02	21·91	22·89
Booleroo Centre	0·09	19·09	14·24	15·20
Port Germein	0·07	18·24	11·64	12·45
Wirrabara	0·08	25·89	18·28	19·27
Appila	0·02	19·25	13·74	14·69
Cradock	1·05	10·84	9·98	19·27
Carrieton	0·06	10·20	11·37	12·35
Johnburg	0·04	9·54	9·70	10·63
Eurelia	0·05	12·01	12·20	13·06
Orroroo	0·06	13·92	12·41	13·24
Nackara	—	10·23	10·49	11·16
Black Rock	—	12·42	11·61	12·46
Oodlawirra	0·15	12·80	—	11·62
Peterborough	0·09	15·97	12·23	13·24
Yongala	0·06	16·96	13·37	14·44
NORTH-EAST.				
Yunta	0·21	10·36	7·72	8·43
Waukaringa	0·19	6·94	7·29	8·00
Mannahill	0·39	5·42	7·53	8·30
Cockburn	2·38	8·16	7·23	7·91
Broken Hill, N.S.W.	1·34	6·73	8·75	9·58
LOWER NORTH.				
Port Pirie	0·16	17·91	12·44	13·19
Port Broughton	0·07	12·90	13·30	13·93
Bute	0·41	19·05	14·69	15·38
Laura	0·05	21·93	17·11	17·99
Caltowie	0·14	19·48	15·81	16·74
Jamestown	0·13	19·81	16·68	17·75
Gladstone	0·20	18·64	15·49	16·32
Crystal Brook	0·14	17·85	14·93	15·81
Georgetown	0·22	21·51	17·46	18·39
Narridy	0·08	17·37	15·05	15·89
Redhill	0·15	19·57	15·72	15·56
Spalding	0·11	18·69	18·00	19·13
Gulnare	0·28	22·83	17·64	18·62
Yacka	0·12	18·60	14·51	15·32
Koolunga	0·10	16·26	14·51	15·43
Snowtown	0·36	18·55	14·91	15·62
LOWER NORTH—*continued.*				
Brinkworth	0·04	18·73	14·81	15·74
Blyth	0·19	17·69	15·86	16·76
Clare	0·26	26·34	23·42	24·54
Mintaro	0·39	24·41	22·16	23·34
Watervale	0·29	26·06	25·67	26·91
Auburn	0·33	24·53	22·95	24·00
Hoyleton	0·02	17·42	16·47	17·33
Balaklava	0·28	14·66	14·73	15·52
Port Wakefield	0·25	14·14	12·35	12·96
Terowie	0·08	15·90	12·32	13·39
Yarcowie	0·02	16·41	12·76	13·63
Hallett	0·25	20·63	15·43	16·43
Mount Bryan	0·15	21·98	15·64	16·70
Kooringa	0·26	19·83	16·98	17·90
Farrell's Flat	0·10	19·41	17·68	18·66
WEST OF MURRAY RANGES.				
Manoora	0·22	21·90	17·73	18·82
Saddleworth	0·36	22·51	18·57	19·54
Marrabel	0·21	22·84	18·86	19·83
Riverton	0·22	22·60	19·83	20·73
Tarlee	0·25	18·24	17·17	18·09
Stockport	0·43	20·29	15·92	16·80
Hamley Bridge	0·17	19·30	15·63	16·55
Kapunda	0·30	20·46	18·82	19·81
Freeling	0·33	18·77	16·94	17·87
Greenock	0·15	21·08	20·53	21·60
Truro	0·58	19·00	19·10	20·02
Stockwell	0·43	20·99	19·15	20·15
Nuriootpa	0·34	23·60	19·51	20·62
Angaston	0·58	22·53	21·34	22·43
Tanunda	0·36	21·71	21·06	22·04
Lyndoch	0·43	23·32	22·46	23·48
Williamstown	0·71	28·88	26·56	27·63
ADELAIDE PLAINS.				
Owen	0·28	15·16	13·47	14·00
Mallala	0·23	17·53	15·77	16·59
Roseworthy	0·21	19·50	16·51	17·32
Gawler	0·32	19·06	18·13	18·99
Two Wells	0·24	17·67	14·94	15·74
Virginia	0·43	19·42	16·27	17·14
Smithfield	0·41	21·90	16·64	17·42
Salisbury	0·20	21·33	17·70	18·55
Adelaide	0·36	24·76	20·09	21·09
Glen Osmond	0·57	28·49	24·77	25·95
Magill	0·36	29·12	24·24	25·49
MOUNT LOFTY RANGES.				
Teatree Gully	0·41	27·52	26·05	27·29
Stirling West	1·60	51·11	44·89	46·78
Uraidla	1·81	55·09	42·12	43·82
Clarendon	0·63	36·23	31·43	32·80
Morphett Vale	0·36	23·93	21·63	22·59
Noarlunga	0·49	23·23	19·58	20·33
Willunga	0·29	27·00	25·04	25·13
Aldinga	0·28	22·81	19·35	22·09

RAINFALL—*continued.*

Station.	For Nov., 1932.	To end Nov., 1932.	Av'ge to end Nov.	Av'ge Annual Rainfall.
MOUNT LOFTY RANGES—*contd.*				
Myponga	0·69	32·81	28·01	28·94
Normanville	0·42	21·72	19·89	20·67
Yankalilla	0·55	24·05	21·99	22·80
Mount Pleasant	0·72	30·29	26·16	27·21
Birdwood	0·71	32·69	27·99	29·16
Gumeracha	1·26	36·08	32·02	33·36
Millbrook Rsvr.	0·56	33·55	33·41	34·95
Tweedvale	0·86	39·29	34·47	35·83
Woodside	0·87	34·80	30·98	32·23
Ambleside	0·79	35·94	33·52	34·88
Nairne	0·60	31·52	27·01	28·13
Mount Barker	0·77	44·54	30·43	31·71
Echunga	0·66	38·56	31·90	33·14
Macclesfield	0·52	30·16	29·31	30·46
Meadows	0·56	38·55	34·77	36·10
Strathalbyn	0·29	17·91	18·52	19·35
MURRAY FLATS AND VALLEY.				
Meningie	0·32	20·68	17·62	18·42
Milang	0·33	17·03	14·29	14·96
Langhorne's Crk.	0·16	18·26	13·99	14·76
Wellington	0·09	20·99	13·84	14·58
Tailem Bend	0·45	23·01	14·68	14·61
Murray Bridge	0·03	15·54	12·92	13·68
Callington	0·24	15·96	14·47	15·25
Mannum	0·14	14·56	10·91	11·51
Palmer	0·27	18·67	14·70	15·49
Sedan	0·11	11·50	11·53	12·16
Swan Reach	—	10·63	9·93	10·61
Blanchetown	0·06	10·06	10·42	11·08
Eudunda	0·17	19·49	16·23	17·12
Sutherlands	—	12·30	10·11	10·80
Morgan	—	9·11	8·47	9·20
Waikerie	0·05	9·58	8·93	9·69
Overland Corner	0·09	8·10	9·71	10·47
Loxton	0·21	11·95	10·87	11·64
Renmark	0·10	9·80	9·73	10·50
WEST OF SPENCER'S GULF.				
Eucla	0·01	8·56	9·52	10·04
Nullarbor	0·10	13·24	8·23	8·66
Fowler's Bay	0·07	17·57	11·41	11·70
Penong	0·22	16·04	11·40	11·84
Koonibba	0·37	17·57	10·93	11·46
Denial Bay	0·12	11·55	10·90	10·96
Ceduna	0·17	13·83	9·32	9·75
Smoky Bay	—	13·39	9·80	10·20
Wirrulla	0·09	13·85	—	9·57
Streaky Bay	0·12	17·63	14·40	14·80
Chandada	—	15·06	—	—
Minnipa	0·22	17·79	12·97	13·55
Kyancutta	0·19	16·55	—	—
Talia	—	17·06	14·07	14·56
Port Elliston	0·22	22·07	15·86	16·34
Yeelanna	0·46	22·39	15·20	15·73
Cummins	0·28	22·00	16·89	17·46
Port Lincoln	0·30	25·32	18·68	19·37
Tumby	0·23	19·60	13·24	14·00
Ungarra	0·54	18·61	15·96	16·70
Carrow	0·19	14·12	12·35	13·10
Arno Bay	0·26	16·82	11·82	12·40
WEST OF SPENCER'S GULF—*continued.*				
Rudall	0·17	17·48	11·99	12·26
Cleve	0·51	21·35	13·96	14·62
Cowell	0·14	11·65	10·66	11·14
Miltalie	0·15	17·87	12·40	13·56
Darke's Peak	0·18	20·38	14·01	14·86
Kimba	0·04	16·04	11·06	11·53
YORKE PENINSULA.				
Wallaroo	0·03	19·13	13·34	13·90
Kadina	0·11	19·81	14·99	15·63
Moonta	0·08	17·15	14·38	15·06
Paskoville	0·12	17·90	14·88	15·52
Maitland	0·12	23·20	19·17	19·91
Ardrossan	0·07	16·43	13·40	13·95
Port Victoria	0·26	19·89	14·73	15·40
Curramulka	0·21	21·19	17·18	17·88
Minlaton	0·24	20·50	17·21	17·82
Port Vincent	0·14	16·87	13·84	14·49
Brentwood	0·24	19·68	14·85	15·44
Stansbury	0·26	18·18	16·22	16·80
Warooka	0·18	18·74	17·06	17·53
Yorketown	0·20	17·36	16·36	16·93
Edithburgh	0·16	19·41	15·75	16·36
SOUTH AND SOUTH-EAST.				
Cape Borda	0·27	27·22	23·98	24·77
Kingscote	0·42	21·22	18·41	19·10
Penneshaw	0·30	20·89	17·90	18·16
Victor Harbor	0·74	27·75	20·47	21·26
Port Elliot	0·54	21·80	19·17	19·94
Goolwa	0·26	21·48	17·07	17·81
Copeville	0·04	13·47	10·59	11·42
Meribah	0·19	13·48	10·74	11·21
Alawoona	0·01	12·15	9·44	10·02
Mindarie	—	16·52	11·27	11·89
Sandalwood	0·05	15·79	12·78	13·59
Karoonda	0·07	16·22	13·41	14·34
Pinnaroo	0·13	14·74	13·83	14·62
Parilla	0·16	15·40	13·19	13·91
Lameroo	0·16	16·13	15·23	16·16
Parrakie	0·10	18·05	13·66	14·51
Geranium	0·20	18·99	15·56	16·44
Peake	0·03	17·23	15·30	16·21
Cooke's Plains	0·19	21·45	14·59	15·41
Coomandook	0·56	19·27	16·44	17·22
Coonalpyn	0·29	22·10	16·53	17·44
Tintinara	0·83	22·04	17·65	18·70
Keith	0·63	18·53	16·95	17·91
Bordertown	0·50	20·33	18·27	19·32
Wolseley	0·59	22·17	17·51	18·44
Frances	0·76	20·21	18·79	20·03
Naracoorte	0·84	24·21	21·46	22·62
Penola	0·94	24·18	24·82	26·14
Lucindale	0·98	28·65	21·98	23·11
Kingston	0·96	25·85	23·24	24·33
Robe	0·40	27·90	23·65	24·65
Beachport	0·74	33·07	25·93	27·01
Millicent	0·92	31·59	28·55	29·81
Kalangadoo	1·34	36·57	30·94	32·30
Mount Gambier	0·96	32·16	29·02	30·64

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Dec.	Jan.
Alawoona	†	—	—
Aldinga	*	—	—
Allandale East	*	9	6
Alma	*	—	—
Amyton	*	—	—
Angaston	*	—	—
Appila	*	—	—
Appila-Yarrowie	†	—	—
Arthurton	*	—	—
Ashbourne	*	7	11
Auburn Women's	†	R	27
Balaklava	*	R	R
Balhannah	†	—	—
Balumbah	609	—	—
Balumbah Women's	594	—	—
Barmera	*	R	R
Beetaloo Valley	†	13	R
Belalie Women's	†	—	—
Belvidere	*	7	9
Berri	*	—	—
Big Swamp	*	15	12
Blackheath	*	—	—
Black Rock	*	R	R
Black Springs	*	12	R
Blackwood	†	—	—
Block E	*	23	27
Blyth	*	9	6
Booleroo Centre	*	—	—
Boolgun	*	R	R
Boor's Plains	*	—	—
Borrika	*	12	9
Bowhill	613	1	3
Brentwood	*	7	11
Brinkley	*	12	9
Brinkworth	†	—	—
Brownlow	*	—	—
Buchanan	*	13	10
Bugle	*	—	—
Bundaleer Springs	*	15	19
Bute	*	—	—
Butler	*	—	—
Calca	*	—	—
Cadell	*	6	3
Caliph	*	—	—
Caltowie	*	—	—
Canowie Belt	*	7	11
Caralue	*	7	11
Carrow	*	—	—
Chandada	*	—	—
Charra	*	10	—
Cherry Gardens	*	—	—
Clanfield	*	—	—
Clare Women's	†	12	9
Clarendon	*	8	7
Cleve	*	—	—
Cobdogla	*	7	4
Collie	*	—	—
Colton	*	29	26
Coomandook	*	—	—
Coonalpyn	*	15	12
Coonawarra	†	21	18
Coonawarra Women's	†	—	—
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	9	13
Cummins	*	1	5
Cungena	*	12	9
Currency Creek	615	—	—
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	13	10
Elbow Hill	*	5	2
Eudunda	*	10	14
Eurelia	*	7	4
Eurelia Women's	†	—	—
Everard East	*	—	—
Farrell's Flat	*	30	27
Finniss	*	—	—
Frances	597	—	—
Frayville	*	—	—
Gawler River	*	—	—
Georgetown	*	10	7
Geranium	*	31	28
Gladstone	*	9	6
Gladstone Women's	†	9	13
Glencoe	*	13	10
Glossop	*	—	—
Goode	609	18	12
Goode Women's	594	18	12
Greenock	†	—	—
Green Patch	†	8	12
Gulnare	*	—	—
Gumeracha	*	12	9
Halidon	*	—	—
Hanson	*	13	10
Hartley	*	7	11
Hawker	*	—	—
Hindmarsh Island	*	—	—
Hookina	*	—	—
Hope Forest	†	5	—
Hoyleton	*	19	16
Inman Valley	*	15	19
Ironbank	*	—	—
Jamestown	*	R	18
Jervois	*	8	12
Kalangadoo Women's	595	10	14
Kalangadoo	*	10	14
Kalyan	*	21	18
Kangarilla	*	—	—
Kangarilla Women's	594	15	19
Kanmantoo	*	—	—
Kanni	*	—	—
Kapinnie	609	R	R
Kapunda	*	9	13
Karcultaby	*	—	—
Karoonda	*	14	11
Keith	*	8	12
Kelly	*	10	7
Ki Ki	*	—	—
Kilkerran	607	8	12
Kongorong	*	12	9
Koolunga	*	—	—
Koonibba	*	8	5
Koonunga	†	—	—
Koppio	*	13	10
Kringin	*	12	9
Kulkawirra	†	13	10
Kyancutta	*	R	R
Kybybolite	*	8	12
Lameroo	*	10	7
Langhorne's Creek	†	7	11
Laura	*	10	14
Laura Bay	†	13	10
Lenswood and Forest Range	*	—	—
Light's Pass	†	—	—
Lipson	*	10	7
Lone Gum and Monash	*	7	11
Lone Pine	*	12	9
Longwood	*	—	—
Lowbank	*	7	11
Loxton	*	9	13
Lucindale	*	—	—
Lyndoch	†	18	10
McLaren Flat	*	—	—
McLaren Flat Women's	595	1	8
Macclesfield	†	15	19
MacGillivray	*	13	10
Mallala	*	19	16
Maltee	†	R	R
Mangalo	*	R	R
Mangalo Women's	*	—	—
Mannanarie	*	—	—
Marama	†	—	—
Meadows	*	7	12

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.	
		Dec.	Jan.
Meribah	*	R	R
Milang	†	R	R
Millendilla	*	—	—
Millicent	*	30	27
Millicent Women's	596	16	R
Miltalie	†	R	R
Mindarie	*	2	6
Minnipa	*	—	—
Modbury	*	—	—
Monarto South	†	—	—
Moonta	*	—	—
Moorlands	†	14	—
Moorook	*	—	—
Morchard	602	R	6
Morphett Vale	*	—	—
Mount Barker	†	19	16
Mount Bryan	*	—	—
Mount Compass	†	1	R
Mount Gambier	598	9	13
Mount Hope	610	6	10
Mount Pleasant	†	—	—
Mount Remarkable	*	—	—
Mount Schank	*	—	—
Mudamuckla	*	10	14
Mundalla	600	—	—
Mundalla Women's	*	15	12
Murray Bridge	*	—	—
Murraytown	*	—	—
Mypolonga	*	—	—
Myponga	†	15	19
Myrla	*	7	12
Nantawarra	*	8	12
Naracoorte	*	10	14
Narridy	603	—	—
Narrung	†	—	—
Nelshaby	603	—	—
Nelshaby Women's	*	—	—
Netherton	*	7	11
New Residence	*	—	—
North Booborowie	*	—	—
Nunjikompita	*	8	12
Nunkeri	*	7	11
O'Loughlin	*	12	9
Orroroo	*	—	—
Overland Corner	*	7	11
Owen	606	9	—
Palabie	*	—	R
Parilla	†	R	R
Parilla Women's	†	21	18
Parilla Well	*	12	9
Parilla Well Women's	*	27	31
Parrakie	*	—	—
Parrakie Women's	†	20	31
Paruna	614	R	R
Paskeville	*	18	10
Pata	*	2	6
Penneshaw	*	—	—
Penola	*	3	7
Penola Women's	†	R	R
Penwortham	†	8	12
Petersville	*	13	10
Petina	*	24	28
Pinbong	611	—	—
Pinkawillinie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	*	2	13
Port Elliot	*	R	R
Pygery	611	13	R
Quorn	*	—	—
Ramco	615	12	9
Rapid Bay	*	—	—
Redhill	604	—	—
Rendelsham	*	10	7
Renmark	*	—	—
Rhynie	*	—	—
Richman's Creek	*	8	12
Riverton	*	12	9
Riverton Women's	*	—	—
Roberts and Verran	†	—	—
Rosedale	*	—	—
Roseworthy	*	—	—
Rosy Pine	*	—	—
Rudall	*	6	10
Saddleworth	*	16	13
Saddleworth Women's	†	6	3
Salisbury	*	—	—
Salt Creek	*	—	—
Sandalwood	*	—	—
Scott's Bottom	*	9	6
Shoal Bay	†	13	10
Smoky Bay	*	—	—
Snowtown	*	9	13
South Kilkerran	608	13	10
Spalding	*	—	—
Springton	†	7	4
Stanley Flat	*	R	16
Stirling	*	—	—
Stockport	*	—	—
Strathalbyn	†	—	—
Streaky Bay	*	23	27
Tailem Bend	*	15	19
Talia	*	30	27
Tantanoola	†	3	7
Tantanoola Women's	597	7	4
Taplan	*	R	R
Taragoro	611	8	12
Tarcowie	*	—	—
Tarlee	606	—	—
Tarpeena	*	—	—
Tatiara	*	—	—
Thrington	*	—	—
Tintinara	*	—	—
Truro	†	R	R
Tulkineara	*	15	12
Tweedvale	*	15	19
Two Wells	*	—	—
Ungarra	*	15	19
Upper Wakefield	*	R	R
Uraidla and Summertown	*	5	2
Veitch	*	—	—
Virginia	*	—	—
Waddikee Rocks	†	10	7
Waikerie	*	9	13
Wallala	612	14	11
Wanbi	*	28	25
Wandearah	*	13	10
Warcowie	†	R	R
Warcowie Women's	†	R	R
Warramboo	612	R	R
Warramboo Women's	597	R	R
Wasleys	†	8	12
Wasleys Women's	†	1	5
Watervale	*	19	16
Wauraltee	*	13	10
Weavers	†	12	9
Wepowie	*	12	9
White's River	*	—	—
Whyte-Yarcowie	*	—	—
Wilkawatt Women's	*	—	—
Williamstown Women's	*	7	4
Williamstown	*	—	—
Willowie	*	26	23
Wilmington	†	R	R
Windsor	*	—	—
Wirrabara	*	—	—
Wirrilla	*	R	R
Wirrilla Women's	*	1	5
Wirrulla	*	21	18
Wolseley	601	12	9
Wudinna	*	—	—
Wynarka	*	—	—
Yacka	*	—	—
Yadnarie	†	R	R
Yallunda Flat	*	—	—
Yandiah	605	R	27
Yaninee	*	—	—
Yantanabie	*	—	—
Yeelanna	*	7	11
Yorketown	*	—	—
Younghusband	*	—	—
Yurgo	†	—	—
Yurgo Women's	*	—	—

* No report received during the month of November † Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

WOMEN'S BRANCHES.

BALUMBAH.

August 9th.—Present: 12 members.

At the inaugural meeting held on August 9th, officers were elected and a programme of meetings arranged.

Making a Mattress of Fleece.—At a further meeting held on October 5th, attended by 10 members, the following paper was read by Mrs. R. Wohling:—"In making a wool mattress one should choose fresh sheep skins, say, not more than three weeks old; they must also be fairly woolly. It takes about six skins to make a reasonably thick mattress, double bed size. It is somewhat hard to wash all the skins on the same day because of needing so much hot, soapy water, and it is suggested to wash one fleece every washing day and prepare it during the week. Cut the skin in six pieces when preparing for the ordinary washing, and allow it to soak until ready for washing. Have the copper full of clean soapsuds, and use water as hot as the hands can bear it, using plenty of soap. Put the pieces through the wringer and rinse in clean, clear water, changing water as it becomes dirty. Hang out to dry in single pieces, allowing both sides to dry. When thoroughly dry the wool can be shorn off the skins, then teased with the hands. Then it is ready for the case. Fill the case tightly and evenly into the ticking, which has been joined on three sides. Sew up fourth side when filled and stab it after the manner of a factory mattress. Use small pieces of leather top and bottom, and for sewing a mattress needle and twine are necessary, or an ordinary bag needle will do. A wool mattress will last a lifetime and it will not lose weight as most other fillings do." (Secretary, Miss C. Riches.)

GOODE (Average annual rainfall, 9.75in.).

August 17th.—Present: 15 members and 12 visitors.

Cooking Display.—The following awards were made.—Cooking—Miss M. Lutz, Miss V. Linke, Mrs. Fagan, Mrs. Lutz, Mrs. Schwarz. Sweets—Miss V. Linke. Jams, &c.—Mrs. Kelly. Chutney—Mrs. Linke. Soap—Mrs. Watson. Needlework—Miss V. Linke, Mrs. Lange, Miss C. Paech. Children's section—Miss D. Linke, Miss J. Schwarz. Flowers—Miss V. Linke, Mrs. Smith, Miss D. Linke. Vegetables—C. Paech. Farm products—Mrs. Linke. Men's section—Mr. Kelly (sheaf of green wheat). (Secretary, Miss C. Paech.)

KANGARILLA.

August 17th.—Present: 16 members, six visitors.

Useful Hints.—The following were given by Mrs. Thorpe:—*A Good Stove Polish.*—¾ pint turpentine, 1 cake black lead, 1 cake blacking, melted together. After polishing with a brush, if rubbed with a cloth it will take all surplus black off, so that if the hands come in contact with the stove it will not blacken them. To improve sausages, put ½ teaspoonful of curry in the dripping before frying and they will fry a golden brown. To make flowers last a long time, put an aspro in the water. A nice sweet for dessert when stewing fruit—add a little extra water and 2 tablespoonfuls of sago. The sago to be put in when the fruit is boiling; if this is put in a mould, it will turn out like jellied fruit. For preserving the soles of boots, apply equal quantities of beeswax, olive oil, and mutton suet melted together. A pinch of ground ginger in rhubarb takes away its sharp taste. To make passion fruit butter:—1doz. passion fruit, 4 eggs, 4 dessertspoonfuls butter, and 1lb. sugar. Mix all together, stir well, and cook in a double boiler until the mixture is as thick as honey. Store in pots and keep airtight. It should keep for some time, and is delicious on bread and butter, and it also makes a filling for cakes and tarts. (Secretary, Mrs. Steer.)

KALANGADOO (Average annual rainfall, 32.30in.).

August 13th.—Present: Eight members.

Melon Recipes.—Each member who gave a recipe also exhibited a small sample of jam. Mrs. Davies: *Melon and Ginger.*—3lbs. melon cut up in pieces, 8 cups water, 2 lemons sliced finely. Boil ¾ hour, then add 6lbs. sugar, ½lb. preserved ginger. Boil steadily another ½ hour, and bottle while hot. Mrs. Messenger: *Melon and Passion Fruit.*—6lbs. melon, 4 lemons, 18 passion fruit, 12lbs. sugar, 16 cups water. Cut up melon and cover with water. Cut up lemons and cover with boiling water and let stand all night. Add lemons to melon in the morning and boil until melon is clear. Add sugar and boil ¾ hour, add passion fruit about ½ hour before jam is done. Mrs. Dowdell: *Melon and Pineapple.*—4lbs. melon, 1 large tin pineapple, ¼ teaspoon cayenne pepper, 2 lemons, 6 pints water, 9lbs. sugar. Cut up melon, pineapple, lemons, let stand all night with water. In morning boil for 1 hour, then add sugar gradually, then pepper, and boil another ½ hour after all sugar has been added. (Secretary, Mrs. H. Dowdell.)

McLAREN FLAT.

October 6th.—Present: 19 members.

Recipes for Pastry Fillings.—*Lemon Cake Tart.*—1 cup sugar, 2 eggs, 1 tablespoonful melted butter, 1 cup milk, 2 tablespoonfuls S.R. flour, rind and juice of lemon. Line dish with pastry. Beat yolks of eggs and sugar together, add butter and milk, then flour and lemon. Then add whites of eggs beaten to a stiff froth, pour into dish, and bake a light brown. *Date Tart.*—1lb. dates, ½ gill water, juice of ½ lemon, ½lb. good short crust. *Method.*—Stone dates and put in saucepan with water and lemon juice. Stir over fire until consistency of thick jam, turn on plate to cool, make short crust, and line sandwich tin. Fill with date mixture and cover with pastry, glaze with sugar and water, and cook in moderately hot oven for 15 minutes. *Chocolate Raisin Pie.*—1 tablespoonful cornflour, ½ tablespoonful cocoa, 2 tablespoonfuls sugar, 2 eggs, vanilla, 1 cup seeded raisins, 2 cups milk. *Method.*—Mix cornflour, sugar, and cocoa together, warm milk, pour a little on cornflour to blend, and bring remainder to boiling point, stir in cornflour mixture, and cook 2 or 3 minutes. Cool, add beaten egg yolk, raisins, and vanilla. Line a tart plate

1932 CALENDAR 1932

MAY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
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15	16	17	18	19	●	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	●
19	20	21	22	23	24	25
26	27	28	29	30	...	...
...	...	...	...	...	...	...

JULY

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	●	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	●	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
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SEPTEMBER

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	●	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	...

OCTOBER

S	M	T	W	T	F	S
30	31	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	●	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

NOVEMBER

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
●	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	●	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

1933 CALENDAR 1933

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	●	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

FEBRUARY

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	●	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	...	...	...	...
...	...	...	...	...	...	...

MARCH

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
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19	20	21	22	23	24	25
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APRIL

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MAY

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JUNE

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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● FULL MOON.

with short pastry, pour in filling, and bake 20 minutes in moderate oven. Beat whites to stiff froth, fold in tablespoonful sugar, pile on top of tart, and brown. *Lemon Cream Pie.*—3 tablespoonsfuls cornflour, 2 eggs, ½ pint water, 2 or 3 lemons, using rinds of 2, 1oz. butter, ½ cup sugar; line piedish with rough puff pastry. *Method.*—Take sufficient water from ½ pint to make cornflour into smooth paste, add remaining water and butter, and cook 3 minutes. Take off fire, add lemons, sugar, and beaten egg yolks; beat well. Pour mixture into piedish and bake. Beat whites to a stiff froth, stir castor sugar in lightly, and spread on top of pie; put back in oven for few minutes till a pale fawn color. (Secretary, Mrs. C. Robertson.)

MILLICENT (Average annual rainfall, 29.81in.).

August 19th.—Present: 10 members.

CAKE RECIPES.—Mrs. Altschwager supplied the following:—*Blowaway Sponge.*—½ cup cornflour, 2 teaspoons plain flour, 3 eggs, ½ cup sugar, ½ teaspoon soda, and 1 of cream of tartar. Beat eggs and sugar for 8 minutes. Add flour, &c. Bake in moderate oven. *Baked Roll.*—Make a good scone mixture, roll out, spread with jam or stewed apples, roll up as a roly-poly, and place in a deep pie dish. Pour over it 1 cup of hot water in which 1 tablespoon of butter and 1 tablespoon of sugar have been dissolved. Bake in a moderate over for half an hour. *Coffee Cake with Compressed Yeast.*—2½ cups flour, 4 eggs, 1 cup sugar, ½lb. butter, 1 cup warm milk, 1oz. compressed yeast. Mix yeast in a cup with a little sugar and warm milk. Mix all dry ingredients together, melt butter in the milk. Beat eggs until light, then add all liquid to the mixture. Stand to rise, after mixing, for six hours. Spread on an oven sheet, warmed, let rise for another hour. Bake one hour in a moderate oven. The same mixture makes a fruit cake with the addition of sultanas, currants, peel, and an icing made of 1 cup of plain white sugar, ½oz. butter, and ½ cup of milk. Boil in a saucepan for eight minutes, stirring well. Flavor with essence and beat until as thick as cream. Spread on cake when cold. (Secretary, Mrs. W. Varcoe.)

MILLICENT (Average annual rainfall, 29.81in.).

September 16th.—Present: eight members.

STAINING, POLISHING, AND VARNISHING FLOORS.—Mrs. A. Nitschke gave the following suggestions for staining floors with Condy's crystals, which can be bought for about 1s. 9d. lb. Use 1 teaspoonful of crystals to 1 pint of water; make up a bucketful at a time. Use a mop made out of old cloths, in the same way as you mop a floor. If the floor has not been stained before do it over three times, letting it dry in well each time. When quite dry, polish it with the following polish:—4ozs. soap, 4ozs. candles, 8ozs. beeswax, 2 pints water, 4 pints turpentine; boil for 10 minutes before adding the turps, which must be added after removing from the fire. Mix thoroughly. *Floor Wax.*—¼lb. beeswax, 1lb. paraffin, ¼ pint raw linseed oil, 1¼ pints turpentine. Melt beeswax and paraffin in a tin standing in a vessel of hot water, then mix in the oil and turpentine. The mixing should be done in a room where there is no flame. *Washing Day Hints.*—Mrs. Varcoe gave the following:—To set colors in new materials before washing grate 2 medium-sized potatoes as fine as possible, add ½ cupful of vinegar and ¼ cupful of salt. Allow the mixture to stand for 10 minutes. Then add 1 gallon of rain water. Let the articles soak in the mixture before "tubbing." *Novel Uses for Old Felt Hats.*—Lamp wicks of any size or shape can be cut from men's soft felt hats. Brush the felt to remove dust and dirt, and cut through the brim to the crown. When enough strips are cut, soak them in vinegar for about 4 hours, dry in a light airy place for a day or two, and they will be ready for use. As silencers for furniture, as backings under carpet edges subject to much wear, as polishers for silverware, glass windows, linoleum, and glazed tiles, strips cut from old felt hats are excellent. They are useful also as hot-plate mats and iron holders. *Shellac Varnish.*—Mrs. Altschwager read the following paper:—"Shellac and french polish are one and the same thing, only that one is applied with a brush and the other with a rubber. Orange shellac may be purchased at the chemists and methylated spirits at a grocer's. To make shellac varnish or french polish, a wide-mouthed jar is half-filled with the orange shellac, then the jar is filled with methylated spirits, and the whole shaken at intervals. After 1 hour the mixture will be ready for use. Probably the handiest thing available to the constructor of wireless receivers is shellac varnish. With it he can polish his cabinet, giving it a surface equal to the energy he displays over the job. He can use it to paint cardboard tubes and so bring them almost to the efficiency of ebonite; the shellac not only improves the insulating properties, but also stiffens and makes them impervious to moisture. If it is used at a fairly stiff consistency, coils may be painted with it and the windings kept in place. Oilcloth which has a dull appearance will be greatly improved by a thin coating of varnish. For french polished goods, take equal parts of turpentine, vinegar, methylated spirits, and raw linseed oil and place them in a bottle in the order mentioned. If this is not done the mixture will curdle and be useless." (Secretary, Mrs. W. Varcoe.)

TANTANOOLA.

August 31st.—Present: 15 members.

The following "Biscuit Recipes" were supplied by Miss Telfer:—*Cream Biscuits*: 1 cup cream, 1 cup sugar, 1 egg, enough S.R. flour to stiffen (about 3 cups); mix sugar and cream, add egg, beat for 5 minutes, then add flour and roll out thin; bake in moderate oven. *Champagne Biscuits*: 2 cups flour, ¼lb. butter, 1 cup sugar, 1 teaspoon cream tartar, ½ teaspoon carb. soda, 1 egg, 1 tablespoon milk; beat egg and sugar together, add milk, rub butter in flour, mix into a stiff dough; bake for 10 minutes. *Sao Biscuits*: Take 2 cups flour, 1 tablespoonful cornflour, pinch salt, ¼ teaspoon baking powder, sift all together, rub 2 tablespoons butter into flour, mix to a stiff dough with a little milk and roll out very thin; cut with round cutter and prick with a fork. *Red Cross Biscuits*: 2 cups rolled oats, ¾ cup flour, 1 cup brown sugar, 1 tablespoon treacle, ¼lb. butter (oiled), pinch salt; mix dry ingredients, then add 1 teaspoon carb. soda dissolved in 2 tablespoons of boiling water and the oiled butter while hot; let stand till mixture is cool, roll into balls and put on slide; bake in a slow oven. *Ginger Nuts*: 3lbs. flour, ¾lb. butter, 1lb. treacle, 2lbs. brown sugar, ½oz. spice, 1oz. ginger, 1½ teaspoons carb. soda, ¾ cup milk; mix dry ingredients, then add treacle and milk; bake in a moderate oven. (Secretary, Mrs. E. Telfer.)

WARRAMBOO.

At the September meeting of the Branch Mrs. Daniels gave an instructive demonstration of icing cakes. The speaker explained the kinds and quantities of the various ingredients to be used, and replied to numerous questions. (Secretary, Mrs. A. Collins.)

SOUTH-EASTERN.

FRANCES (Average annual rainfall, 20.03in.).

June 1st.

Dairying.—Mr. P. Chittleborough contributed the following paper:—"Since other branches of farming are giving such poor returns, dairying has come to the fore, not that it gives great returns, but to many it is the only means of ready cash. Indeed many who used to only milk one or two cows are milking six or even more. As it takes no more to feed a pure-bred cow than one of a mixed breed, and as there is always a demand for good stock, a person who is taking up dairying might as well start with pure stock. It is best to pick out the breed which one fancies and concentrate entirely on that breed. To see a herd of cattle all the same type is more attractive than a mob of varying colors, sizes, and shapes. I prefer Ayrshires; not only are they good producing cows, but they are large-framed and will bring a good price as fat stock. When beginning it is advisable to buy a good bull and one or two good cows from a reliable strain so that the pure strain is retained. Very few have the money to outlay on purchasing all pure-bred cows, and until the herd is well established it is advisable to use the best of the grade cows and their stock. To keep up the quality of the herd, constant culling is necessary, for only the best are to be kept, and it is necessary to keep a record of the amount of milk and cream given by each cow. To do this every day entails a lot of work, but if it is done once a day, say two days a week twice a month, a fair estimate of the cow's producing qualities should be obtained. A good cow should have a good chest and good girth measurement, with as straight a back as possible, good length of body, wide prominent hips, and long from the rump bones; this allows the cow to carry a good, wide udder well up behind, also well forward, allowing plenty of milk room, and as a rule the teats are well spaced and not cramped together. An important part in the herd is the bull. It is said that the bull is more than half the herd. Therefore it is necessary to procure a good type of bull. Not only are his looks important, but also his records as to a breeder. The true measure of a bull, especially for dairying, can only be obtained by keeping records of his daughters. A bull that can be relied on to breed high-producing stock is worth his weight in gold. Points to look for on the bull are to procure one with good masculine appearance, large, long body with good, deep chest and girth measurement. A strong point from a dairying point is to see that the bull has large teats well spaced. This good point in most cases comes out in the heifers having good, large, well spaced teats. It is much better to breed your own stock; animals bred on the farm—provided they are well-bred and properly fed, managed, &c.—will thrive better than those purchased. Cattle born and bred on the place are acclimatised, and thus their constitutions are specially fitted for the climate and soil conditions. Purchased cattle have to settle down to new conditions. A cow in milk should be fed with grain and chaff even when grazing on good grass. For example, a cow giving 30lbs. to 35lbs. milk daily should receive by parts oats, bran, and pollard, with a little salt and superphosphate, and feeding 10lbs. to 12lbs. chaff with about three double handfuls of the above mixture, the cows milk well and keep in good health. Cows in calf should be given six weeks to two months' spell before calving again, and during that time feed given to them is by no means wasted, because they milk much better when calving again. Most of the feed can be grown on the farm. Feed which will give good results consists of good hay chaff with oats and bran mixed, and when there is plenty of moisture, pollard is also a good food for milk production. A good plan is to have several small paddocks, say two to three acres in each, and top dress them with 1cwt. super each year early in autumn after the first rains so they will get a good start. As a rule, one small plot will graze six to eight head for a week during the day, then turn them on a fresh plot, closing the grazed one up for a while; by so doing one is able to run far more stock. By feeding the cows in the bails with good feeders or nose bags there is very little waste of chaff, &c. Cows also require as much clean water as they can drink, more so when fed on grain mixtures which have not been damped. The herd should be handled as quietly as possible, and not dogged or raced about; most cows are easily excited by rough handling, which greatly reduces their milk supply. During rough weather they should be provided with shelter; not only does the cold affect the milk supply, but the cows lose condition. This can be overcome by rugging, but it is expensive and not altogether a success, because the cows get very itchy, and rub the rugs to pieces. A 15gall. separator is sufficient for three or four cows, but for over four cows, a larger one is needed in accordance to number of cows. The washing of utensils, &c., has to be very thorough; milk and cream are very easily spoilt by being tainted, and in many instances the trouble occurrs from unclean utensils or coming into contact with strong odors. Sometimes, however, this is caused by the cows eating strong flavored grass. In this case cows should be turned on these parts directly after milking and taken off about 2 hours before being milked again. Skim milk can be used for rearing the calves. Feed the calves well and keep them in a small, well fenced paddock, so that they do not learn to creep through the fences. Well fed calves soon develop, and one is able to sell at a good price. Surplus skim milk comes in very well for pig rearing, which is closely associated with dairying.'' (Secretary, E. Pfitzner.)

MOUNT GAMBIER (Average annual rainfall, 30.64in.).

August 12th.—Present: 15 members.

Mr. R. A. Potter, M.A. (Head Master of the Mount Gambier High School) delivered an instructive address, '' Agricultural High Schools.'' (Secretary, G. Gurry.)

September 9th.—Present: 12 members.

AFFORESTATION.—Mr. B. Swartzkopff read the following paper:—''Nearly every country of the world is looking with grave concern at the fast diminishing forest areas on the one hand and the ever growing demand of wood and timber on the other. For as the demand for wood increases year by year, the timber reserves are taxed to the utmost and, if no adequate provision for planting trees is made we shall, before many years, be faced with a timber famine. No doubt the extraordinary demand for timber during the late world war has led to a deplorable depletion of forests, and to make good the loss sustained it has become necessary to make double efforts in matters of re-afforestation. It is indeed gratifying to note that in common with other countries of the world Australia is well awake to a sound policy of forest preservation; and of the Commonwealth States, it is our own State which is doing the most valuable work in this direction. From the Official Year Book of the Commonwealth, 1924, the following is extracted:—'Economical forestry aims at the preservation and development of existing forests areas by safe-guarding againsts fire and other destructive agencies, by expert supervision of the removal of timber, by judicious thinning, by ré-afforestation of denuded areas, with new suitable growths of local or exotic origin. It provides also for the continuance of an indispensable form of national wealth by the afforestation of available bare lands, adapted to the growth of various timbers. Though large areas of virgin forests still remain in Australia, the inroads made by timber getters, by agriculturists, pastoralists, who have destroyed large areas by ring-barking, are considerable, and it is not unlikely that the climatological changes are caused thereby. It is stated that beneficial consequences follow on the planting of trees on denuded lands, or along the eroding coasts, and that a forest-covering beneficially regulates the effects of rainfall. Successful planting of exotic trees in various parts of Australia has demonstrated that the climate is suitable for the cultivation of a large number of the most valuable and beautiful of the world's timber trees.' Australia's timber resources, compared with the rest of the world, are of no great extent. A glance at a map of vegetations will convince us that a timber belt runs around the south-east and east coast of our island continent, and a narrow strip covers the extreme south-west corner of Western Australia. South Australia is particularly unfortunately situated as far as natural forests are concerned. Apart from Mount Lofty Ranges, Flinders Ranges, and her south-eastern portions, she can claim no forest-clad areas, and it is this factor that has made her the most ardent champion of a systematic scheme of afforestation. Naturally, when our pioneering forefathers came to Australia's hospitable shores to found new homes and make the best of this virgin soil they were compelled to destroy much valuable timber. Stately gums had to yield to the determination of the pioneers, and the cleared areas rewarded those stalwarts with the well-earned products of the soil. Although much of the timber served useful purposes for the erection of homes, barns, fences, &c., yet great quantities must have been destroyed, as no use could be found for the same. But, while destruction went on in those days, re-afforestation was not even hinted at, and with an ever-increasing population grew an ever-increasing demand for more timber, with the one result that the stately trees disappeared and land became bare. In Queensland, for instance, farmers, unaware of utility of the fine, handsome tree known as the silky oak, cut this tree down ruthlessly in order to use it for fence posts and even firewood; and in this and many other ways much valuable timber, especially hardwood, has suffered great inroads, so that to-day Governments are forced to do their utmost to check rapid depletion. I am convinced that there is a close relationship between forests and rainfall. Take again our so-called Murray areas. The more the land becomes denuded and trees disappear the more the rainfall seems to become irregular. Even the South-East, which can boast of a fairly regular rainfall, seems to be somewhat influenced since the once luxuriant timber growth has become very diminished. In districts like the South-East, what opportunities do we have to cultivate suitable trees alongside our roads and highways—not necessarily limited to town areas, but to adorn farms, sheep runs, and to serve as wind-breaks, shelter, &c. While much may be and is being done by governments, private enterprise may add considerably to the extension of tree-cultivation areas, and every tree planted in this sense forms a valuable asset to the district. At the interstate Conference of Forestry, held at Hobart in 1920, forestry authorities of the various States estimated that, to meet the future requirements of Australia an area of 24½ million acres of indigenous forest lands will be necessary. These were distributed among the several States as follows:—New South Wales 8,000,000 acres, Victoria 5½ millian, Queensland 6,000,000, South Australia 500,000, Western Australia 3,000,000, Tasmania 1,500,000. This area has been endorsed by the Premier's Conference held in that same year, in aiming towards permanent forest reservation. Of the 24½ million acres set down by the Premiers' Conference as necessary to meet our requirements, 10,412,637 acres have been realised, or about 42 per cent. The timber reserves, which embrace 7,836,499 acres, with the additional Queensland National Parks, bring the above figures to nearly 18,500,000, but it must be understood that the timber reserves are liable to cancellation any time. Also much of this forest area is included in almost inaccessible mountain region, and the above quota mentioned refers to timber for merchandise purposes only. This fact fully emphasises the necessity of judicious timber cultivation. South Australia, whose geographical position has greatly handicapped forestry on a large scale, is nevertheless foremost in its efforts to utilise to the fullest extent what areas there are available. Here in the South-East vast areas have been planted with the *Pinus insignis;* judging from present observations this tree is yielding a timber for which there seems to be a great demand. The particular merits of this timber seem to lie in the fact that it is easily grown, reaches maturity within a reasonable space of time; maintenance of forests, cutting down, &c., incurrs a minimum of expense; the timber lends itself to a multitude of uses, and is becoming a favorite with most timber tradesmen. It has also been ascertained that this pine is an admirable tree in assisting to drain swamp areas. However, in spite of all this, one cannot help feeling whether at the same time some consideration should not be given to the re-afforestation of our indigenous hard woods, particularly in this part of the State. It does seem deplorable that useful stringy-barks and blackwoods, which once formed a conspicuous feature of the garden of the State, no more delight the eye; and the remark may be pertinent that even now it is not too late to give consideration to this matter. Touching briefly the planting of exotic trees the climatic conditions of this part are most favorable to quite a number of English and European hardwoods and softwoods. The reason for this is that we are situated almost in latitudes that touch climates known as the maritine and Mediterranean. Thus we are all familiar with such trees as English Oak, Elm, Plane Tree, and Ash, which all seem to thrive well in these parts. Again the species known as Douglas Fir makes a stately show in the town. One fact gleams upon us, and that is the adaptability of the South-East to quite a variety of exotic trees, and it is here where there is plenty of scope for beautifying parks, recreation grounds, and other areas in and around the town; for we should ever remember the two-fold aim of afforestation; firstly, to provide for the requirements of timber for utility purposes, and secondly by upholding permanent forest areas we are assisting the rainfall of the district. Towns and country schools can do very much in this direction on Arbor days, and every opportunity and encouragement herein will always find ready response with the teachers, not only in school grounds, but any available place where suitable trees can be planted. Taking a glance at timber production for the same years mentioned we find that local timber sawn and hewn amounted to a total of 587,441 super feet throughout Australia. *The Value of Other Forest Products*: Eucalyptus oil amounted to the value of £39,990, exported chiefly to United Kingdom and United States; the production of tan bark is estimated at about 30,000 tons per annum. The total value of forest production during 1922-23 amounted to £9,344,000. On the other hand our imports from foreign countries, such as United Kingdom, Canada, India, other British countries, Norway, Sweden, United States, &c., amounted to £1,260,550. In 1922-23 the total reads 92,088,449 super feet. This was all dressed timber. Undressed timber for the same periods totalled: 1919-20, 143,208,872 super feet, values at £2,078,906; 1922-23, 272,535,558 super feet, valued at £2,790,936. All these timbers were chiefly softwoods, as yellow pine, red wood oregon, kauri, white pine, red deals, the hardwoods were chiefly oak from U.S. and Japan, and teak.'' A good discussion followed. (Secretary, G. Gurry.)

ANNUAL REPORT FOR 1932.

MUNDALLA (Average annual rainfall, 19.09in.).

[*The following report was presented by the Hon. Secretary (Mr. H. Ross) at the Annual Meeting of the Branch held on October 13th.*]

''The year generally has been one of profit in agricultural information, and our best thanks are due to the officers of the Department for the prompt and full information given on the various matters submitted to them, either for criticism or in the form of inquiry. Eight meetings were held during the year, and the attendance at most of the meetings was quite up to the average, which, considering the phenomenally wet winter and the resulting bad roads over which members were compelled to travel, may be considered very satisfactory. In accordance with an established custom, the election of officers took place at the August meeting, with the following results:—Chairman, Mr. Reg. A. Dinning; Vice-Presidents, Messrs. E. Hunt and J. T. Ryan; Committee, Chairman, Vice-Presidents, Messrs. R. Wiese, E. Milne, E. Packer, F. Trenorden, and Secretary; Auditor, Mr. Hokin. At our last annual social we had the pleasure of the company of Mr. S. Shepherd, of Kybybolite (Member of the Advisory Board), and Messrs. E. S. Alcock and H. H. Orchard. The attendance from Mundalla at Kybybolite visiting day last year was much smaller than usual, due no doubt to the dry spring and the resulting early hay-cutting.

Bureau Exhibit.—In response to an invitation to compete in the Bureau exhibit class at Bordertown Show last year, the Branch entered into the business so enthusiastically that the first prize was annexed. A very creditable exhibit of an educational nature was also staged at the Mundalla Show in March.

The annual South-Eastern Conference was held at Bordertown last March, and was well attended by members of this Branch. The Branch was represented at Annual Congress (1932) by Messrs. L. M. Dinning and F. O. Trenorden, and these two gentlemen gave full reports of the proceedings at our last monthly meeting.

Papers, &c.—At the September Meeting (1931) Messrs. L. M. Dinning and E. Knowling, the delegates to Congress for 1931, gave full reports of the proceedings of Congress. Both gentlemen went to a good deal of trouble to bring back all the information possible, and received the hearty thanks of the meeting.

The November meeting took the form of a Working Bee, when 38 members and friends assembled on the property of the ex-President, Mr. R. Wiese, for the purpose of removing and cleaning up the ruins of Mr. Wiese's homestead, which was destroyed by fire. The party was well equipped with drays, trucks, and tools, and in a few hours had the whole of the debris cleared away and the site cleaned up in readiness for the new home. Thus a Branch of the Agricultural Bureau can be an asset to its district in other ways apart from its value as an educational institution.

At the February meeting Mr. Orchard explained and demonstrated the art of budding fruit-trees and roses. Mr. Orchard also gave individual instruction during the day.

The March meeting was taken up with making arrangements for the Bureau exhibit at Mundalla Show and the South-Eastern Conference held at Bordertown.

At the June meeting Mr. J. T. Ryan gave a very fine address on 'Pig Keeping.' The lecture was much enjoyed, and gave rise to a good discussion.

The subject for the July meeting was supplied by Mr. L. M. Dinning, who read a lengthy paper intitled 'The Nature and Control of Prevalent Wheat Diseases.' The paper contained much information and advice of a very practical and commonsense nature. The paper was illustrated with the aid of microscopic slides and a blackboard. At this meeting the secretary was authorised to proceed with the installation of a first-aid veterinary cabinet.

The Annual Meeting was held on August 16.

At the October meeting the Congress delegates (1932), Messrs. L. M. Dinning and F. Trenorden, gave excellent reports.

At the 1932 Annual Meeting Mr. Ross announced the launching of a scheme for the rehabiliation of the Mundalla Branch of the Bureau. 'I have long recognised that the old system of running a Bureau Branch is becoming obsolete, and that new and up-to-date methods and features of special interest must be introduced from time to time in order to meet the demands of modern times. The scheme includes the following features:—

1. The installation of the best and most up-to-date veterinary first-aid cabinet possessed by any Branch in South Australia. This cabinet has not been prepared in a haphazard way, but has been gone into thoroughly with the aid of Mr. R. Wiese and the veterinary officers of the Stock and Brands office, and the first-aid treatments available are the most up to date that can be had; also, Mr. Wiese and the Government veterinary officers have promised their assistance and advice at all times, and we will be kept advised of any new features that will be of use to us.

2. The installation in the near future of a Babcock milk tester to be used under the supervision of Mr. Downes, the South-Eastern Dairy Instructor. At the present time many people keep cows, but it is hoped that with the installation of this new feature that the position will be reversed and that the cows will keep the people.

3. A programme of meetings for the year that will include more lectures by scientists and experts than has been the case in the past, and with a greater variety of subjects in order to cater for all members.

4. The reconstruction of our Branch inquiry service. It should be known to all that through the medium of the Bureau the people have the best inquiry service possible, and it is free to all. The departmental experts and scientists are anxious to help through this service, and members will be encouraged in future to make more use of this fine service and bring their problems along.

5. To make a special effort to encourage members to take part in Crop and Fallow Competitions, and thus make these Competitions of greater interest and thereby improve farming practices as much as possible.

6. To hold a Homestead Meeting occasionally as a diversion from the usual meetings, to give members an opportunity to see the methods practised by other farmers and engender a good social spirit among the people.

7. Endeavor to have a Ladies' Branch formed at Mundalla in order to strengthen the Branch when arranging exhibits, &c.

8. To encourage the school children to become interested in the Bureau, by working in conjunction with the head teacher so that they will grow up to look upon the Bureau as an important institution and be eager to join up and take our places when the time arrives for them to do so. As a move in this direction I intend to endeavor to have included in the Mundalla Show catalogue classes for this purpose, and for which I will gladly donate the prizes. New features will be introduced from time to time, and it is hoped in this way to sustain the interest in the Bureau as time goes on.'

Before concluding, I would like to thank very sincerely all who have assisted in any way during the year, particularly those who have entertained the departmental officers whenever necessary. Their efforts have been much appreciated indeed. With the co-operation of every member we should be able to build up this Branch to a standard equal to any Branch in the State. I intend to devote most of my spare time to the successful working of the Branch—to adopt it as a hobby—and hope to be able to give all a very efficient Bureau service.''

WOLSELEY (Average annual rainfall, 18.44in.).

July 11th.—Present: 18 members.

The Hon. Secretary (Mr. E. Sharrad) read the Annual Report, and officers were elected for the ensuing year. An instructive paper, ''Home Gardening,'' was read by Mr. W. Starrick.

Poultry.—Mr. A. Grosser read the following paper at the meeting held during August:—''To-day the poultry industry ranks amongst the leading industries in the State. Breeding and feeding are two of the most important points. When feeding grain throw it amongst the straw-litter so that the birds have to exercise for their food. A mixture of bran and pollard is a good change. Shell grit is very important, and the fowls should have as much as they can eat, it reduces the number of soft shell eggs. Green feed is essential, lucerne preferably. Lettuce and silver beet are also useful. Water should be always kept very clean in the troughs. Bore water is better than rain water—it contains the minerals the fowls require. Meat meal, which makes a valuable addition to the food, can be provided for by killing an old sheep and boiling it. The White Leghorn and the Black Orpington are the two best breeds for the average farmer. The White Leghorn is a good layer, lays an egg averaging from 2ozs. to 2½ozs.—the egg demanded by the export trade. The Black Orpington lays a brown shelled egg not so large, averaging about 2ozs., and is a much better table bird. In selecting a breeding pen choose the very best hens from the flock, allowing from 6 to 8 hens to each cockerel. Pullets are not recommended for breeding purposes.

See that the hens are even, of good appearance, clean around the eyes and legs, with a good egg carrying capacity. Avoid all crooked breasted birds for breeding. The pens should be so arranged that the fowls get the morning sun. Obtain the best cockerels from the best laying strain procurable. This will improve the flock and increase egg production. For breeding it is advisable to have a separate pen or room for the incubation. Breeding should take place from August until October. I prefer an old hen if procurable, for which purpose it will pay to keep a few for setting purposes. Set them on the ground because the eggs require moisture to bring the chickens to maturity. Place the hen and chickens in a yard well sheltered from cold west winds and allow them to receive the morning sun. The feed should consist of ground wheat, oatmeal, maize, charcoal, and good clean water, allowing them to help themselves to greenfeed. As a rule there are more cockerels than pullets, and the roosters should be killed as soon as they are fit to eat. Do not keep a laying hen longer than 2 to 3 years. Mark them in order to tell their age, and destroy any sick fowls. The sleeping pen should be free from draughts and provided with 1½in. square perches. Do not allow vermin on the perches, use waste oil to keep these in check. I recommend a kerosene tin cut open with sand for the nesting material to keep the eggs as clean as possible. South Australia is endeavoring to standardise a 2oz. egg; therefore our aim must be to breed a strain of poultry that will produce the most 2oz. eggs in a year. Eggs are all tested with an electric light, and any eggs showing the slightest sign of poor quality are rejected. The collection of eggs should be made at least once a day, more if time will permit. Every egg that leaves Australia takes from 6 to 7 weeks before it reaches the British consumer, and every egg must be branded 'Australia.' It is essential that every egg be fresh and of the best quality before being shipped.''

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

MORCHARD (Average annual rainfall, 13.59in.).

August 12th.—Present: 14 members.

Bookkeeping.—Mr. F. Stainer read the following paper:—''In the past many people engaged in the various phases of one-man trading—for example, small businesses, farmers, &c.—have paid little attention to bookkeeping. Since the passing of a law requiring the presentation of account books in court in bankruptcy cases these persons have been obliged to make up their accounts, and the man on the land has found that the keeping of his own books has proved itself to be a source of very informative information. An account book has a highly practical use, in that a man has at his finger tips a complete statement of his financial position and he can see precisely when and how his money has been used. On the other hand, when we trust to memory alone we invariably omit many small items, each perhaps amounting to only a few shillings, but which soon add up to pounds. If the details of all expenditure were correctly entered in a book, they would always be available for future reference and guidance. Elementary bookkeeping is not an involved or complicated matter. For practical purposes the only necessity is the account book, in which is entered the receipts and expenses as they are incurred. The first essential to correct methods is promptness of entry, otherwise inaccuracy will arise as a result of the delay. The book should be divided into periods, each occupying a page. For the average man a page of a standard account book will last a month, so that one page may be taken for each month of the year. At this stage the individual bookkeeper may choose one of two alternatives: he may use a single page on which to keep a statement of both receipts and expenses. The columns in the book would then read from the left: date, statement, £ s. d. under the heading of debtor, and £ s. d. under creditor. A second and more satisfactory method is to utilise a double page, one-half being devoted to receipts and the other half to expenses. Both sections are ruled up similarly: date, statement, £ s. d. Whichever system is used, it will be found exceedingly useful to insert a narrow column in which to enter the number of the receipt form. The double page is preferable because expenses and receipts are completed separately and are more easily consulted and worked out than the single leaf. At the end of the monthly period the totals under debtor and creditor are made up and the difference calculated. This balance, whether it be a credit or a debit balance, forms the first entry on the new page, and the statement column contains the words 'Balance brought forward,' or words to that effect. At the end of the year the 'balance-sheet' is drawn up. This may be done in a separate book or on a double page of the account book. It is usual to specify the period for which the balance-sheet is taken at the top of the page. The balance-sheet is a condensed form of the receipts and expenses, the invoice totals replacing the detailed accounts of the monthly periods. In the balance-sheet the expenses and receipts are always kept separate to facilitate checking. The total of the expenses, together with the balance in hand at the time, must equal the total shown in the receipts column in order that the balance-sheet will be a true and complete account of the year's transactions. It is always advisable to keep receipt-forms for a considerable period past. This may be done by filing them, but in such a condition they are liable to be damaged, whereas pasting them in a book precludes any possibility of their being torn or damaged accidentally.'' Mr. Stainer exhibited pages ruled to illustrate his method of bookkeeping. (Secretary, A. McCallum.)

MIDDLE-NORTH DISTRICT.

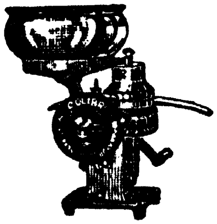
(PETERBOROUGH TO FARRELL'S FLAT.)

NARRIDY (Average annual rainfall, 15.89in.).
August 6th,—Present: 17 members and 14 visitors.

Knowing that great activity has been recently displayed in connection with the agricultural class at the Narridy School, the Secretary of the Bureau invited the senior pupils to supply the material for the August meeting. ''Herd Testing'' was the subject chosen by Masters Bruce Smart and Ira Pascoe, who gave a practical demonstration of testing for butterfat and then carried on their work to demonstrate the production of commercial butter, and later the application to the herd. The large attendance was astonished at the ease and fluency with which these boys delivered their demonstration, and also at the calm and deliberate way in which they answered all queries *re* the work, thus showing their listeners that they held a thorough grip of their subject. Master Fergus Smart deilvered an interesting discourse on ''Incubator Brooding,'' his confidence and delivery being points most noticeable. Several members later availed themselves of the opportunity to test milk under the direction of the boys, a diversion which created much interest. (Secretary, H. B. Cox.)

NELSHABY (Average annual rainfall, 17in.).
August 11th.—Present: 12 members.

A TICK-PROOF FOWL HOUSE.—The following paper was contributed by Mr. K. Noble:—''The description and house that follows is simple, and not very difficult or expensive to attach to any build of house. It may be built of wood, iron, part straw, or netting of



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any size or height desired. The house which is built all of iron is the best. There must be a clear space about 3in. wide all the way round the house, just below the roof. Through this space there must be no connection between the sides and the roof, except that of the posts. This space will allow ventilation, and room enough for a galvanised iron cup which is soldered around the posts at that height, to stop tick reaching the roof. The cup, one around every post connected with the roof, is of a cone-shape, round or square to suit the post, and must be kept full of very thin oil or kerosene. The brim of the cup should not touch the post or roof. This is very important. The roof should overhang to prevent rain blowing in on the fowls. The perches should be joined and stayed to each other, and swung, 18in. clear of the sides and any posts within the house, by wires or rods through other cups of oil to the roof. The cups around the posts, and the clear space or opening around the house, prevent tick climbing to the roof, from which they could drop to fowls on the perches. The cups around the wires or rods on which the perches are swung would stop any tick formerly on the fowls going to the roof for shelter. Tick cannot reach the roof or perches. Old tick do not stay on a fowl for very long, and if the perches are well painted or oiled, they will not be able to live in them, but will drop to the floor to seek shelter. They can regain the perches by being carried by a fowl, but this is unlikely, as older tick rarely travel during daylight. If they did they would probably be eaten, and most fowls roost before nightfall, and are very sensitive about their legs during the day, so that unless they are sitting on the ground tick have no chance of getting at them. Chickens when put in a house are usually put in boxes or brooders on the floor. If put in boxes, either place them on very low perches or build a low stand or table—with cups similar to those of the house—attached to the legs; brooders may be treated likewise. Care should be taken not to allow the chicks to jump from any great height until old enough, or they may become crippled. Also, put them in their boxes early in the evening, or tick will get on them before they are placed in the boxes. Boxes or brooders should be examined occasionally for tick. If using timber for posts, the cups can be nailed to the posts and be well painted on the inside, but this will need a very large cup. It is better to bolt a short piece of iron—with cup soldered on—to the top of the post. The most suitable iron will be square or round in shape, and about 13in. long, with the cup about 7in. from the upper end. The cups are cone-shaped, either round or square. Wooden posts may harbor tick, which live on fowls that roost on the floor. For this reason, if possible, do not have nests in the house; some hens like to roost in or on them. Do not have the perches swung single, but fastened one to another; if the former, the fowls may not roost on them, as they usually sway too much. Tick in a house of this description should soon die out, but keep the cups full as a preventive. The first attack of the tick is always likely to be severe. Old houses can easily be made free from tick if this principle is adopted. The opening around the house to prevent tick reaching the roof may cause a draught. If it does, it can be stopped by fixing a part of a sheet of iron on a slant, from the sides inwards and upwards, just under the opening; this will spread the air over the house. If the opening is not more than 3in. wide, and the sides of the house not less than 5ft. high, with the perches 2ft. above the floor, there will not be any direct draught on the fowls.'' (*Reference to ''the part sheet of iron'' is found in ''Modern Housing of Poultry'' in the ''Journal of Agriculture,'' volume xxxv., No. 6, where it is recommended as being draught proof.*) (Secretary, A. Lawrie.)

REDHILL (Average annual rainfall, 15.56in.).

Present: Eight members.

Care and Feeding of Farm Livestock.—The following paper was read:—''The primary object of this paper is to once more bring before members the urgent responsibility of obtaining best results from the animals which subscribe to our living. *The Farm Team*: The horse must be well attended—a good stable if possible, if not a straw stack in a small adjoining paddock, where he may shelter. The stable should be well ventilated; an iron roof and overhead ventilation in addition to doors which may be closed or open as desired. Water in trough, which should be cleaned out periodically.—The trough should be about 2 chains distant from the stable and thus escape the winter smells and summer flies. Feeds.—The relative quantities of hay and chaff will depend upon the quality of the hay, and also whether the horse has been educated to eat hay and not waste it. Feed him often and not too much at a time and he will soon eat hay up cleanly. With grain, oats stand alone, and we do not feed enough of this strength-giving grain. We have all heard the argument that too much grain will result in sore shoulders, but more of that trouble is caused through lack of grain than too much. Feed the horse up to it, and he will eat a bag of oats every two to three weeks with profit to his owner. For example, for a seeding period of 5-6 weeks, a 10-horse team requires about 20 bags of oats. Barley is quite all right, needs to be crushed; and bring the horse to it gradually. I never buy bran or pollard, but reply on farm grown corn. Do not forget the mineral wants of farm stock. Super and salt will satisfy most animals. Mix together and add some crushed corn; sprinkle on feed once or twice a week, or place in a lick. Also, when a horse's diet is changed from stubbles to stable feed, a handful of Epsom salts every few days will quite possibly result in all the team remaining in good order. Often times horses are lost at that time of the year. A handful every week of Epsom salts is also a big help right through the stable feeding period. Foals should be allowed into the stable as soon as natural grass fails—it will result in stronger and better animals. *The Cow*: There is still too much of the practice—bring in the cows, milk, and turn them out again—and we wonder why the cows are not so good as our neighbors. If a cow is worth keeping, keep her for profit by feeding. 1lb. of crushed corn with chaff for every 4lbs. milk is recommended. When herbage is good, she may not eat that much, but give her what she wants. And do not forget super and salt. If calves are worth rearing feed them well. A small straw stack is very acceptable to cows, and whether they are milked in yard or paddock is immaterial. *Pigs*: Young pigs require exercise for their development. Provide a small yard for this with plenty of water. The sty must be dry. Old railway sleepers are very serviceable as a sty floor; put in some hay, and keep the place clean. If skim milk is available, 4lbs. of barley to 1gall. of milk makes almost a perfect ration. If milk cannot be obtained, crush grain or soak in water. For brood sows and store pigs oats will be found preferable to wheat or barley. Super and salt are also needed, and pigs will relish the kitchen ash bucket emptied into their yard. Pigs will also eat a quantity of hay; it has been stated that pigs will turn into profit the damaged hay that we sometimes discard. But the better the hay the better the profit. Also it may be noted: sell the pigs for market before they become a burden on the grain store. Animals are much like humans, treat them well and returns will be satisfactory.'' (Secretary, S. Pengilly.)

YANDIAH.

September 9th.—Present: 12 members.

Attention to Small Items on the Farm.—Mr. A. Keller read the following paper:—''During the present period of low prices for farm products and heavy overhead expenses in the nature of rates, taxes, interest, &c., when big speculations and large incomes are out of the question, the main consideration is to be satisfied with small profits and to save them. There are a great many instances where small savings can be effected on the farm, very often by lengthening the life of a certain item. When a fence has fallen into disrepair, it is not much better than being without any fence, but by keeping the wires well strained at all times, it may lengthen the life of a fence very considerably, because with tight wires, even if there are a few loose posts, these are held in position by the wires, thus the stock do not find weak places. A system which is in vogue on some farms for lengthening the life of strainers and gate posts is to nail a piece of galvanized iron or a kerosene tin over the top of the post to prevent the rain soaking down into the wood, causing it to decay, which also encourages the white ants. When a new fence is being erected, it is always advisable to see to it that plenty of dirt is put around the posts after they have been rammed, so that no water may soak down along the butt of the post. After the fence has been standing for a year or so, dry rot often eats away the outside of a post, leaving holes all round the butt of the post, and a little time put into filling up around the posts is well spent. Time spent in destroying sparrows at this time of the year is well worth while. About two years ago my neighbors and I made a raid on sparrows at the same time, with satisfactory results, and the decrease seemed very noticeable right throughout the year. It did not only mean so many less sparrows, but if those destroyed had been allowed to live, they would in all probability have increased three or four fold. Nothing is more annoying than to see a couple of acres of good wheat eaten out or broken down by sparrows around a homestead or around trees or stacks. I advocate a general organised raid on sparrows right throughout the district, and the Government and the producers would benefit. When ploughing or cultivating a paddock, remember that it is not a half a day's good work and then being slovenly which counts, but start off well, and continue making each furrow as good or better than the one before it. At harvest time remember that 12 months' work has been put into the crop. Stack the hay well and take a little care to put on a good roof, so that the elements cannot spoil the hay. When reaping, do not overlook the fact that every grain wasted is a double loss; it does not only mean one grain less, but if it were saved it would mean one more grain for sale. A little time spent in making adjustments and housing the harvesting machinery may make all the difference to its efficiency and life. If depending on horses as your chief motive power, try to keep their shoulders sound by keeping the harness in good order. Prevention is better than cure, and once a horse's shoulder has been allowed to become sore, it is a hard task to cure it without putting it out of work. Should a burn appear, immediately see to the collar, perhaps it is too large or too tight fitting; if adjustments do not help, change it, or see to the back band, perhaps it requires shortening.'' (Secretary, F. Jettner.)

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

OWEN.

August 8th.—Present: 15 members.

Bulk Handling.—Mr. G. Rapko opened the discussion with a short address. He said bulk handling would very likely be tried in South Australia this coming harvest, and farmers should gain an insight into the system before it was installed. Mr. Harkness was in favor of bulk handling, having recently visited New South Wales, where he saw it in operation. Questions were not lacking, and a lively discussion followed. (Secretary, M. Freebairn.)

TARLEE (Average annual rainfall, 18.09in.).

August 16th.—Present: 12 members.

Farm Economies.—Mr. D. Kelly read the following paper:—"The old distinction between the husbandman and the merchant is breaking down, for the farmer of to-day has to combine the essential duties of both. This growth in complexity has brought with it many benefits, and also many faults. The present-day farmer cannot afford to concentrate wholly on the production of his crop; he has to spend a certain amount of time in disposing of it. He has to spend more time in studying markets and prices. The capital outlay in farming is many times greater than it was, therefore there is a much greater responsibility. The increased capital outlay has brought with it many new items of expendture not previously known. There is depreciation—now a fair proportion of a farmer's expenditure—and interest on capital. The duty of the farmer now is to reduce his cost of production, in order to be able to pay these added expenses and still return a profit. It seems improbable that wheat will rise over 3s. 6d. per bushel for the coming season, therefore the farmer must reduce his expenditure to less than that figure. Perhaps the surest way of reducing costs per bushel is by growing more bushels for the same cost. The Department of Agriculture, in its experiments at Turretfield, estimated that it cost 4s. 10d. per bushel to grow wheat. That was a 20-bush. crop. If they had grown a 40-bush. crop on the same land the cost would have been 2s. 5d. per bushel. Some of the costs have fallen since that estimate was made, but the fact remains that the cost per bushel is dependent on the yield. By growing more wheat per acre we need not be afraid of flooding the market again, because the genuine surplus is not very large and is rapidly disappearing. Another way of reducing cost of production is by rotation cropping. The bare fallow-wheat rotation is not satisfactory—firstly, because the land has no chance to regain its fertility; and secondly, because half of the farm is unproductive fallow each year. The crop off half the farm has to carry the expenses on the whole of it. Mr. F. W. Coleman, of Saddleworth, gave an address recently, in which he outlined what appears to be a sound rotation. It is a seven-year rotation, and is as follows:—(1) Wheat; (2) oats (grazed); (3) wheat; (4) fallow; (5) wheat; (6) oats (grain and hay); (7) fallow. The fallow is thus reduced to 28 per cent. of the total farm area, as against 50 per cent. in the bare fallow-wheat rotation. A fallow returns nothing, but the rent or interest has to be paid. There might be a slight falling off in yields, but this is counterbalanced by the decreased cost of production, for a crop which is grown on stubble costs only half that of a crop grown on fallow. In this rotation the hay (oats) is grown on stubble land. A great deal of wheat grown on fallow is cut for hay for the farmer's own use. This is not a desirable practice, especially in this district, where oats do well on the firm red soils. It is also a good plan to sow a combine width of oats around the fences. It takes a little more time and trouble, but it is worth it. The bare fallow-wheat rotation restricts the number of sheep that the average farmer can carry, for few have waste scrub land. The adoption of a more extensive rotation permits the carrying of a much larger flock. Sheep do not require a great deal of attention in this district, and are a source of income if prices are at all reasonable. There is another idea for reducing the cost of production which is gaining favor. We may assume that the farm is of 600 acres. Of this 200 acres are sown with wheat, the stubbles of 200 acres are left as pasture, and the remaining 200 are fallowed in September or October and sown with wheat the following year. Under this system there are 400 acres for sheep from January until September, then 200 acres until January again. By following this practice many more sheep can be carried, but it remains to be seen whether the inceased pasturage will compensate for the possibly reduced yield per acre. The tractor has met with its share of adverse comment, and in many cases has been placed in the shed and a few more horses purchased. By doing this the farmer is in danger of over capitalising his property. We all know of the evil results of over capitalisation in secondary industries; the same is possible in the primary industres as well. The added burden of interest which the farmer is asked to bear by the purchase of additional plant in the form of more horses, may be, in some cases, 'the last straw that breaks the camel's back.' We must also remember that the man who realises that he has made a mistake early is better off than he who keeps on hoping that things will right themselves. A substantial economy could be effected by farmers combining to buy their necessities, particularly cornsacks—25 bale lots are often quoted at as much as 1s. per dozen under small lots. The price of pigs at present is very low, and there is no justification for the erection of expensive sties. Roseworthy College has been advocating that pigs should be allowed to graze in small paddocks instead of being fed always in a sty. It is much cheaper to put a cyclone fence around a small paddock and sow some barley than it is to erect sties and feed on grain, and the pigs grow and fatten as well. It always pays to buy good breeding stock, even though they may cost much more. The elimination of waste is one of the greatest single factors in reducing costs. Super bags can be washed carefully and used for seed wheat or for oats or barley several times over. Crushed grain for all stock, especially cows and pigs, is much to be preferred on the score of economy to whole grain. The control of mice and rats, where possible, very largely reduces the amount of waste. It is only by strict attention to detail and judicious expenditure of what money he has, that the farmer will be able to bring down his cost of production to a level commensurate with the prices of his products.'' (Secretary, E. Kelly.)

YORKE PENINSULA DISTRICT.

KILKERRAN.

August 16th.—Present: 11 members.

The Sheep and Wool Industry of New Zealand.—Paper read by Mr. G. Brown:—''Out of a gross area of 43,000,000 acres in New Zealand, 19,000,000 are cultivated and 24,000,000 are in an unimproved state. Of the 19,000,000 acres cultivated, grass lands enormously predominate, the area under grass being 17,000,000 acres. A survey of the uses to which land in the Dominion is put, shows that the number of dairy farms is 36,311; sheep farms, 17,305; mixed dairying and sheep, 6,600; mixed agricultural and sheep, 4,654; general mixed farms, 3,000; orchards, 1,578; market gardens, 966; poultry farms, 400; nurseries, 95; timber growing, 146; flax growing, 62. The sheep and wool positions in New Zealand and Australia, respectively, are vastly different. New Zealand carries about 30,000,000 sheep, the approximate numbers of the various breeds being as follows:—Crossbreds, 24,000,000; Romney, 3,830,000; Corriedale, 1,250,000; Merino, 1,200,000; Southdown, 221,000; Lincoln, 87,000; English Leicester, 86,815; Border, 86,714; Shropshire, 21,000; Ryeland, 10,000; other breeds, 62,000. In Australia British breeds and crossbreds taken together form only a negligible fraction of our 106,000,000 sheep. On account of the rainfall and level nature of the cultivated areas, sheep, in New Zealand, are subject to footrot. Pure Romneys and Romney crosses being almost immune to footrot, and at the same time ideal mothers for export lambs explains why that breed predominates in the agricultural and dairying districts. Corriedales and Merinos are confined mainly to the drier grazing areas, which consist of undulating and mountainous country enclosing the Canterbury and Taeri plains in the South Island. Winter is severe in the Dominion, and it is necessary for sheep-farmers to lay in supplies of roots, such as mangels and turnips, as well as ensilage and hay for that season. As the weather becomes colder, the growth of grasses diminishes. To counteract this, in recent years it has become a fairly general practice to apply quick-acting fertilisers, such as superphosphate and sulphate of ammonia, to prolong the growth of grasses as long as possible during late autumn and early winter months. Wool growing in New Zealand is a secondary consideration to fat lamb production. The total value of the wool clip for 1930-31 was £3,500,000, whereas frozen meat was worth approximately £10,000,000. Figures for Australia during the same period show a return of about £60,000,000 for wool, and £1,500,000 for frozen meat. To anyone interested in the fat lamb trade, the New Zealand method of breeding and marketing is an object lesson. There are approximately 30 freezing works in the Dominion, and these handle between them 8,000,000 lambs each year. Recently I had the opportunity of inspecting one of the latest works at Christchurch, and was greatly impressed by the efficiency of the whole organisation. This particular works treats 30,000 lambs per week during the season. The daily output of tallow is 30,000lbs., and of scoured wool 16,000lbs. Each day 1,000,000galls. of water are used. Heads, bones, and blood are converted into manure. Livers, hearts, sweetbreads, &c., are packed and exported. The manufacture of casks and boxes is also part of the work undertaken. On questioning the manager about the best type of ram to use as a sire for export lambs, he informed me that in the Smithfield market lamb was bought solely on an inspection of the hindquarters and loin. Therefore, to obtain the best results, it was necessary to use a ram which would produce a lamb with well-fleshed hindquarters. He had no hesitation in recommending the Southdown as the best ram for that purpose. According to the Department of Agriculture of New Zealand, the relative popularity of the various British breeds as sires for fat lamb production is as follows:—First, Southdown; second, Romney; third, English Leicester; fourth, Lincoln, Border Leicester; fifth, Shropshire. All export lamb from the Dominion is under the control of the New Zealand Meat Export Board, which has been in existence since 1922. The Board consists of eight members—five elected by the producers of fat lamb for export, two appointed by the Government, and one elected as a representative of the stock and station agents. The Board has a representative in London well versed in every phase of the business. New Zealand lamb is well advertised all over England. During the year 1929 1,000 specially selected lamb carcasses went from New Zealand to make displays at 65 of the most important centres throughout England. Under their 'presents of lamb' scheme, the New Zealand Meat Export Board has distributed up to June 30th, 1929, no fewer than 16,000 single carcasses of lamb to individuals and concerns throughout England. In order to still further improve the quality of export lambs, the Board this year organised a district competition in export lambs. The two islands were divided into districts, and the Board offered perpetual challenge shields for the best district display of lambs from each island respectively. Altogether 921 lambs were shipped and were displayed for judgment in the London market. This afforded a further excellent opportunity of advertising the Dominion's best quality lambs on the Smithfield market. (Secretary, E. Koch.)

SOUTH KILKERRAN.

August 16th.—Present: 13 members.

Woolclassing.—The following paper was read by Mr. R. Castine:—"In speaking of wool in the greasy state one's thoughts naturally turn to what is meant by the term counts 60's, 64's, 56's, or 58's, &c. It means that a wool classified as 60's will spin 60 hanks of yarn, each hank measuring 560yds. long when the greasy wool has been scoured. In woolclassing it is the aim to sort out the different counts, so that the buyer may form an estimate as to the amount of yarn that will be obtained when it has been scoured. By placing each of these counts in its correct bale growers naturally obtain more consideration from the buyers. Should buyers see that the wool is graded and uniform, there is naturally more competition, whereas an ungraded clip only attracts those who are out to make money by re-sorting and re-selling. In speaking of correct matching of fleeces it is not meant that a large number of lines should be made in small clips, but that fine and coarse wools should be kept in separate classes. Where large clips are dealt with, then more lines can be made, but endeavor to class the clip so that the greater part of it will be sold in the main catalogue and not among the star lots. Again, if the clip of the small grower does not reach four bales (the limit for the 'big room'), and he has graded his wool, it gives his brokers a better chance of inter-lotting those star lots. Make the clip look as presentable as possible, buyers are naturally attracted by presentable get-up. Of late years it has been found that one line of pieces was sufficient, keeping pieces as low as possible. Skirt very lightly. Do not make the mistake of putting fleece wool into pieces. After skirting the fleece, take out the back—the width will vary according to the condition of the fleece. This may sound rather drastic, and it certainly looks it when the operation is being performed, but examine a bin of side wool against a bin of back wool, and observe the difference. The side wool, which contains the shoulder (which is the best), side, and leg, will show up in contrast to the spindly, shafty, back wool. When branding the back wool, all that is necessary is to brand it 'A' in the case of fine wools and 'B' for coarse wools. The side wool may be branded as 'A Merino' or 'B Merino,' as the case may be. When matching 'side wools' take into consideration the lightness, brightness, length, and strength, and try to keep them even. Discolored or tender fleeces should be kept separate from the main classes. When baling the wool, keep the bales as even as possible, and the ideal weights are 250lbs. for fleece wool and, of course, bellies, pieces, and locks may be heavier, while all stains should be thoroughly dried before baling. Do not on any account press damp wool. When baling use colored twine (blue) for sewing bales; colored twine is easier to pick out before the wool is fed to the spinning machines, and should twine go into the machines there is a danger of breakage. Use stencils for branding bales; writing with a stick and paint does not add to the attractiveness of the get-up of the clip. Clean out the shed before shearing, and erect bins to hold the wool. Make a skirting table, it will last for many years, the cost will be trifling, and the work of skirting, &c., may be carried out with efficiency. Chaff and such foreign matter should be kept out of the wool. Slovenliness does not pay. Wool is a facinating study and with unlimited possibilities—it has many uses, which range from telephone wire insulation to making up into ties. We should wear more wool and induce our womenfolk to wear more wool, and thus help to create a greater demand." (Secretary, R. Hasting.)

WESTERN DISTRICT.

BALUMBAH.

August 4th.—Present: 11 members.

The following points are taken from a paper "Water Conservation," read by Mr. S. Wohling:—The water question had always been more or less serious in this district. This subject should be a farmer's first concern, whether horses or tractor were used, in order to gain full advantage of the feed grown. If adequate provision was not made for water it was folly to start sidelines, because usually one would either use up all accruing profits in carting water or have to sell in a poor market. In conclusion he said it was much cheaper to cart feed than water. (Secretary, A. Jericho.)

GOODE (Average annual rainfall, 9.75in.).

August 17.—Present: 22 members and 14 visitors.

The subject for the evening was "The Best Method of Destroying Rabbits," and as this pest is fast becoming a menace in the surrounding districts it was well discussed. The general opinion was that the best method was to first poison, then dig in the burrows; if these were large ploughing in was preferred. As regards poison, some members favored strychnine on apples; others had had very good results with S.A.P. sweetened with sugar. (Secretary, B. Linke, Ceduna.)

KAPINNIE.

August 19th.—Present: 13 members.

SIDELINES ON A WHEAT FARM.—Paper read by Mr. E. R. Wannan:—"Sheep do not come under this heading. They are an essential part of wheat growing, fertilising the soil, keeping down weeds, and packing fallow being their chief virtues for helping the wheat crop. The three main sidelines are cows, pigs, and poultry. *Marketing Produce.*—This has been one of the greatest difficulties that West Coast farmers have had to contend with. The market of late years, however, has improved for the disposal of dairying produce and pigs. Cream can now be sent to Port Lincoln, usually realising a higher price than butter, besides saving the labor of making up the butter. It is essential, however, to be near enough to the railway to be able to send the cream away twice a week in summer and once a week in winter. The export of pigs from the Port Lincoln

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1933.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

BLACK MINORCAS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

Free on Rail, Salisbury.

DELIVERY.—CHICKS—February and Early March.
EGGS—January and February.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Victoria Square, Adelaide.

C. F. ANDERSON, Poultry Expert.

freezing works has opened up the market for pigs; this also applies to fat lambs. Before poultry raising can be gone in for extensively it will be essential to have a good market for the West Coast. *Cows.*—The number of cows which a farmer may keep depends on the pasture and labor available. Pastures should be top dressed, and every few years be sown in wheat or oat crops and fallowed. For extensive dairying a summer fodder should be grown, preferably lucerne; a small area irrigated if possible. It pays to have good cows, heavy creamers being better than heavy milkers, the Jersey and Jersey-Shorthorn cross answering this purpose best of all breeds. Bails should be provided in weather-proof stables and the cows rugged during cold nights. Rugs can be made cheaply out of three cornsacks and a few pieces of rope. Surplus heifer calves should be sold, either for dairying purposes or for the butcher, and bull calves should be disposed of as soon as they are fit to kill. The West Coast would be better for an improved market for these cattle. *Pigs.*—Pig-raisers, to be successful, must study the consumer, both home and overseas. Consumers' tastes change from year to year, so that the successful pig-raiser must keep in touch with the demand as regards the breed, weight, etc. Pigs should have clean sties to sleep in, a paddock for grazing purposes, and a small yard in which to hand-feed. Wheat and skim milk are excellent food for the pigs; for best results the wheat should be crushed. *Poultry.*—The average flock of fowls on most farms to-day is probably showing a profit, despite the low price consequent on the poor market. If, however, a good market was available it would pay to spend more time and money on poultry by keeping better laying fowls in good pens, feeding with the food required to make them lay well. Bran, pollard, chaffed green feed, meat meal and wheat are the main fods. Plenty of clean sand and shell grit should also be available. Clean water at all times is essential for good laying. Young roosters, culled hens, and aged hens must be sold, preferably after they have been fattened. *Other Sidelines.*—Farmers should keep better vegetable gardens than they do at the present, and thereby cut down their food bill by a substantial amount in a year. Fruit trees and vines are also handy to have on a farm, as some fruits and grapes can be dried and used during the rest of the year. To sum up, a farmer who wishes to make a fair income out of sidelines must be prepared to spend a fair amount of capital. It is also an all-time job, which demands regular hours of work every day of the week.'' (Secretary, A. Giles.)

KAPINNIE, October 14th.

Present: seven members.

Rearing a Calf.—Mr. G. Reimann read the following paper:—''Rearing calves and how to obtain best results.—When taking a calf from its mother it is essential to give it the milk for three or four days, then after that time to dilute the milk to half separator and half whole milk for several days. Gradually give less good milk; about 1 pint to the desired amount of separator milk. It is a mistake to give a calf only two drinks a day as each time they are inclined to drink too much and become very ''poddy''. It is necessary also to keep the bucket, from which the calf feeds, clean; dirty buckets will bring about diseases and the calf does not thrive as well as it should. It is a well known fact that milk makes bone and body; so it is with the calf. I believe, therefore, in giving a calf milk until it is six months old as there is a marked difference between two calves one getting milk three months and one getting milk for six months. To quote results of such I had a calf which had milk for nearly 12 months as I had no pigs to which I could give the milk. The calf also had ''cocky chaff'' and a little oats as I had very little feed in the paddocks. Despite this, it was in good condition, and when killed a few mouths later weighed 450 lbs. It was not a big beast but well developed.'' (Secretary, A. Giles.)

MOUNT HOPE.

August 23rd.—Present: 12 members.

Poultry on the Farm.—The following paper was read by Mr. J. Vigar:—''Now that the Port Lincoln factory is taking eggs, poultry as a sideline on the farm is worthy of consideration. The birds should be housed in good sheds, and kept enclosed throughout the whole of the year. A supply of clean water at all times is essential. The feeding of poultry is one of the chief factors in rearing good fowls. When setting eggs for hatching, select those which are not under 2ozs. in weight. When rearing chickens, a good diet is bread soaked in water and fed with crushed wheat or bran. For the laying fowls wheat screenings can be given in the morning, and, as the birds are running about the yards, there is no need for green feed or meat, because there is plenty of grass and grubs. A brush shed is as good as an iron one if it is built properly, for in winter is warmer and cooler in summer. The best dual purpose breed is the Black Orpington, but for eggs the White Leghorn holds first place. As table birds the Silver Wyandotte or Plymouth Rock are best.'' A good discussion followed. (Secretary, A. Myers.)

PINBONG.

August 13th.—Present : 6 members.

FENCING.—The Hon. Secretary (Mr. C. Scholz) read the following paper:—I have put up four different styles of fences on my farm to find out which is best, both for stock resistance and fire, and the following fence I consider to be the cheapest and most serviceable. Place wooden posts 16yds. apart, then half way between one T or H iron post, and half way between that one wooden dropper; a dropper or post every 12ft. which makes the fence very flexible with only half the number of posts to catch fire. The fence must be 4ft. high with six wires, barb on top, 11in. below another barb, then 10in. below one plain wire 7in. below another plain wire and the two 6in. wires below that to the ground which makes it sheep proof. This fence is the best for all classes of stock, but the wooden posts must be good and at least 4in. thick. Kong mallee, black oak or ti-tree posts are the best and care must be taken to treat all posts with spent motor crank case oil to minimise damage by white ants.

PYGERY.

July 12th.—Present: 15 members.

WHEAT MARKETING IN OUR DISTRICT.—Mr. G. B. Heath read the following paper:—"Farmers in this district have the choice of three ways of selling their wheat, and as we are all trying to obtain the best possible price, it is for us to determine which is the best way to sell. These three ways are:—(1) Selling on delivery or parcel (contract; (2) storing; (3) pooling. Firstly, selling on delivery or by parcel or contract. This is the best and surest way for the farmer. He knows just how much he has realised on his wheat, and is then in a position to know how he can manage financially for the coming year. Storing at present is by no means a reliable security. A farmer, by storing his wheat, is more or less at the mercy of the merchants until his wheat has been sold. While wheat is in storage, a farmer does not know how much he has realised on his harvest, and in the majority of cases at the present time is not in a position to know his true financial position. Pooling is somewhat similar to storing, only a farmer has no control over it once it has been delivered. Probably pooling is all right for a farmer who is financially independent, but a farmer has to wait too long for his money." Mr. Woodrup thought that storing the wheat in a good year might turn out all right, but he favored pooling because the pool generally returned equal to the merchants. Mr. Edmonds supported Mr. Woodrup. Farmers got the benefit of the extra weight gained by the wheat while stored with the pool. Pooling was the best proposition for the farmer. (Secretary, A. Day.)

TARAGORO.

August 11th.—Present: Seven members.

THE FARM GARDEN.—Paper read by Mr. A. Winters:—"For the site for the garden I favor a slight depression, because here the soil is generally more fertile and retains the moisture longer. The selected plot should be ploughed to a fair depth and all stumps and roots removed, and a heavy dressing of cow or horse manure worked into the soil. One of the most important points is to have a fence that is stock-proof around the garden, and if on an open spot, a break-wind should be erected. If the plot has been well dug no trouble should be experienced in growing any of the root vegetables such as carrots, parsnips, turnips, beetroot, &c. If early vegetables are desired, seeds should be planted in seed boxes about March and transplanted when about 2in. to 3in. high. I favor planting carrot seeds in the garden plot; they do not do so well if transplanted. Cabbages and cauliflowers should be spaced about 2ft. apart, and when the cauliflowers begin to form heads the outside leaves should be gathered together and tied lightly. This protects the head from sun and dust. Peas are easily grown and require practically no attention. When planting tomatoes or cucumbers it is advisable to have about 2doz. tomato bushes and ½doz. cucumber. Proper attention can be given to this amount, and they will not use much water. I favor a small shade-house being erected and the tomatoes planted fairly thick (about 4in. apart). These can be looked after without very much trouble, and it will not take nearly so much water for a little thick patch as for 3doz. or 4doz. plants, set out in the usual way, in which each plant has to be watered individually. For cucumbers, dig a trench about 18in. deep and about 8ft. long. This should be filled up to within about 6in. of the top with well rotted horse manure. Seeds should be sown about 1ft apart, and then across the top of the trench mallee boughs should be laid. This will protect the cumumbers from the sun and also help to conserve moisture. If tomato seeds are sown in July the plants will be strongly rooted by November and able to stand up to the hot winds in November. A small corner of the garden should be set aside for flowers. Wall flowers, carnations, or stocks make a nice show, and require very little attention." (Secretary, T. Winters, Cleve.)

WALLALA.

August 17th.—Present: 10 members.

Blacksmith Shop on the Farm.—Mr. R. Nottle read the following paper:—"A blacksmith shop of more or less comprehensive nature is almost an essential item of plant on any farm, no matter where situated; but in this district, where no blacksmith's business is within 50 miles, it is more essential than ever, becoming a necessity which every farm should possess. The number of fittings and tools must, of course, be governed by the farmer's ability to purchase, the number and class of implements used on the farm, and the skill and ability of the farmer, his sons or employees, to undertake different classes of repair work. However, practically everyone who has the will to try can effect sufficient of their own repairs to make a small blacksmith's shop an economic proposition. The following is suggested to meet the needs of the average farm and the farmer of average blacksmithing ability. Select a location with a fair amount of clear space in front of the proposed site. Have the shop, preferably of stone, about 16ft. x 12ft., facing the east, half of the east side at least to be open. Equipment should consist of a forge with blower and anvil of not less than 1cwt.; a set of stocks and dies from ¼in. to 1in.; a drilling machine with bits from ¼in. to 1in.; three or four pairs of tongs—these can be made on the farm with a little practice —a sledge of about 8lbs. and two hand hammers 2½lbs. and 1½lbs. weight; a claw hammer; a hot and cold cutter; a wood brace and bits from ¼in. to 1in.; a hacksaw and blades; a good heavy shifting screwwrench; a set of steel spanners from ¼in. to 1in.; and a steel rule and a drawknife. A few bars of good 5/16in. iron for making links, and ⅜, ½, ⅝, ¾, and 1 bar of ⅞ will be found sufficient for most jobs. Much good material can be obtained from old implements and scrap iron of various sorts. Mallee charcoal can be made to do a considerable portion of the work, and will thus make the coal supply last much longer. The initial outlay in establishing a shop of this kind may seem fairly great, but when placed in the balance with the benefits that will be found to accrue, the balance in favor will be found to amply justify the initial cost. By having a shop at hand, repairs will be effected to implements when first needed instead of resorting to makeshifts, which are usually far from satisfactory and generally spread, through the one weakened part putting a greater strain elsewhere, and causing further breakages, until eventually the machine falls into such a state of dilapidation as to be no longer capable of performing its work properly, and either has to be taken to a smith for a thorough and costly overhaul or else thrown aside and a new implement purchased. The old proverb of 'a stitch in time saves nine,' invariably applies to farm implements. Again, shares can be drawn out and kept sharp, thereby doing better work and lasting longer. Links can be put in chains, doing away with wire links and adding to the life and value of the chains. Hooks, eyebolts, bolts of any length and size required, are always available, saving much valuable time. With a shop always at hand, wet or rough squally days can be profitably spent in overhauling and repairing machinery. In fact, so numerous are benefits that every farmer who is able to establish a shop on his farm will afterwards wonder how he managed to do without one." (Secretary, C. Zippell.)

WARRAMBOO.

August 16th.—Present: 17 members and 16 visitors.

Economy and General Farming.—The evening took the form of a combined meeting, members being present from Wudinna and Kyancutta. Mr. E. Barns (Wudinna) read a paper on the above subject. A discussion on this paper was started by Mr. E. Oswald. He said that so far as the rabbit pest was concerned if everyone did their share towards destroying these rodents they would soon be greatly reduced. Mr. O. Murphy said the seriousness of the rabbit pest was partly due to their neglect by not laying poison in the early part of the year—say in January or February. The rains in April which brought up the early herbage made it useless trying to poison after. However, he had noticed that after every drought the rabbits were thinned out but bred up very quickly in good seasons. He thought that combined efforts would go a long way towards keeping the pest in check. Up around Fowler's Bay in the earlier times every farmer went in for the netting of his boundary as soon as he could, especially those settlers on the smaller holdings. Mr. A. Shepherd (Wudinna) did not agree with harrowing the fallow as mentioned by Mr. Barns. In certain classes of land, especially sandy ground, harrowing was often the cause of drift. Mr. Barns (Wudinna), in reply to a question as to the best combination of implements to use, favored the mould-board plough, rigid tine cultivator, and the combine. He thought this class of implement quite satisfactory if kept in repair and sharp shears and tines were used. He favored harrowing before and after drilling. Asked by Mr. Murphy what quantity of Wimmera Rye Grass he advocated sowing to the acre, Mr. Barns replied that he had only sown 10lbs. of seed in amongst the wheat on a 60-acre paddock. Mr. F. Chilman (Warramboo) asked Mr. Barns how he got on with it in the reapingtime. Mr. Barns used a harvester and reaped it, getting quite a nice lot of seed off it, some of which he gave to his neighbors, and the rest he sowed. Mr. Barns (Wudinna) said he thought it false economy to feed it off the first year. Mr. A. Collins (Warramboo) said he had used a disc cultivator or plough, as he had no other, and did not think the class of implement made any difference. He had grown as good a crop as most people, and did not think the implement made any difference at all. With regard to Wimmera rye grass, he thought the sowing of oats was a better proposition for feed and for eradicating take-all. Mr. Barns (Wudinna) said the destruction of the rabbit pest was becoming a serious trouble to everyone. He did not blame the district council for putting on an ispector to see that everyone did their share in the destruction of this pest. Mr. Randle (Kyancutta Branch) supplied a paper, "Economy Farming," which aroused a keen discussion. (Secretary, E. Adams.)

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BOWHILL (Average annual rainfall, 12in.).

August 15th.—Present: eight members.

Problems of the Mallee Farmer.—Paper read by Mr. G. Siedel:—"The usual method of clearing scrub off the new block is the use of the scrub-roller, which is quite satisfactory, but the rolling down of a too-large an area in the beginning very often means that in later years it is difficult to keep the whole area clear of shoots, and the scrub grows back to almost its original state and is then very hard to handle again. The better plan is to try and keep clear what is originally rolled down. A heavy dressing of super is preferable to light application in the new ground stage to enable the stubble fire to do its work on the shoots. A good fire does more to kill shoots than the continual use of the slasher. *The Best Method of Sowing New Land.*—Some favor the drill, followed by the harrows. Others a light ploughing and then the drill; but in more recent years the combine has been used. The latter method is very hard on the machine on account of the snags. Again, there is a difference of opinion regarding quantity of seed to be sown on new land. The mode of drawing machines and implements (horses *versus* tractors) has been decided definitely in favor of horses, but we are now faced with the fact that our teams are getting older, and the continual breeding of two or three foals every year is necessary. Horses to-day are priced higher than their actual value in comparison with the low price of wheat. Another question to be decided is whether to cart the wheat to the selling centre with horses or buy a motor truck, or have it carted by contract (motor). If the harvest is a large one, carting with the team is a long job, and the horses will be very tired and weary to start preparing the land for seeding. I am inclined to favor the other method of delivering wheat. But does it pay to buy a truck? I am doubtful, but there are contractors who make their living at this work, and it would pay to have a big crop carted and have a fresh team to go on seeding. If the harvest is light, use horses. Sore shoulders are a continual worry, and sometimes, although the harness is in perfect order, the trouble occurs. I favor putting an extra horse in the team if available for machines and implements, and light loading on the roads. The problem of keeping the horses in good health is an important one. Nothing is more disastrous than the loss of a couple of good horses every year, and keen observation and general good management go a long way towards minimising losses. Take care about a too-quick change of feed, and do not work a horse hard all day and then turn him out into a paddock covered with high green feed. It is much better to give a feed of clean, dry cocky chaff before letting him go if there is no other dry feed available. Give the team a drink immediately after taking out of harness, but if overheated do not allow them to gorge too much. The question of working mares in foal too long is often discussed. Light work will not hurt them, even up to a week before they foal, providing they are in strong, healthy condition. Many papers have been written on sidelines on the farm, but there are difficult problems in all, and it is to these that we must look to balance the cost of wheat-growing. Dairying is profitable if conducted correctly in conjunction with wheat. I have been grazing cows on the green crop up to the end of July with some success, but admit that there is a risk in some seasons of spoiling the crop. The alternative is then to feed the cows while the grass is short. In the outlying districts one has to face difficulties in connection with the transport of cream. The labor question must also be considered. A farmer with a family to do the dairy work can manage very well, but with hired labor it is a different question, and naturally does not show so much profit. I find by experience that the health of the cow is more difficult to maintain than that of the horse, and it is common to lose one occasionally. The long dry summers are very hard on milking cows. Other problems which call for close attention are keeping the poultry, pigs, and all other small stock in good health; best methods of keeping mice, sparrows, and insect pests in check; the destruction of vermin which take their toll from the crops and pastures; the blowfly and tick pest in the sheep; and the eradication of weeds." (Secretary, A. Spry.)

PARUNA.

August 5th.—Present: 13 members.

Feeding Stock for Profit.—The Hon. Secretary (Mr. F. Sumner) contributed the following paper:—"My method and experience of feeding stock for profit is as follows:—*Horses*: The profit derived from a horse on the farm is the amount of good and faithful service that it gives. Therefore, to get that work the horse has to be fed properly and cared for. I always have each horse tied in a separate stall—that stops the bosses from having the pick of the feed, and the timid ones will not stand back while the others have their fill. I always feed by measure; good, clean chaff should only be used. Each horse should have about 8lbs. of chaff and from 5lbs. to 6lbs. of oats at each of the three daily feeds. A double quantity of chaff should be given for the night feed. Do not fill up the manger with chaff at any time. No horse will do well on sour and damp chaff that has been picked over and pushed from one end of the manger to the other. If the horses are kept in the stable, feed long hay over the week end. Occasionally change the feed; oats soaked in molasses with a little pollard or bran is a good change for a while. Good, clean, and fresh drinking water should always be available; it plays a big part in the health of the horses. Clean out the trough thoroughly every two days. Groom the team well every morning before putting on the harness; this helps to keep the horses fit, and the team has a much better apearance going to work in the morning and not carrying any of the previous day's sweat on them. Treat the horses well with good feed and care, because it is the only remard they get for their labor. *The Pig*: The pig on the average farm seldom gets a fair deal. No matter what kind of feed is used, always endeavor to give it as clean as possible. Have a broom at the sties and make use of it at each feeding time; sweep out the troughs clean and never give more feed than the pigs can eat at one feed. Barley and oats with a liberal supply of green lucerne is a good feed for topping off baconers. Use skimmed milk and crushed grain for porkers. All farmers do a certain amount of rabbit trapping throughout the year, and in most cases the rabbit is killed and either left on the ground or thrown down a burrow to rot and breed blowflies—a nuisance to sheep owners. If the rabbits are brought home and cooked, they could be fed to the pigs and reduce the feed bill. They do well on the feed mixed with the grain. If the meat is fed to the sow prior to farrowing it will, in most cases, prevent the sow from eating her young. Give to the sow soon after farrowing two or three teaspoons of cod liver oil in her feed; that will prevent losses. Keep sties clean and dry with plenty of straw for bedding on cold wintry nights. *The Milking Cow* is another important factor on the farm. A few good producing cows are a paying proposition on any farm, but they must be fed properly to get payable returns. Feed night and morning with good oaten chaff and oats. Oats are the best milk and cream producing grain for cows. Cows should never be hurried, and if fed properly they will always come home at milking time. A cow that comes home at leisure will give better returns than one that has been driven home in a hurry and is excited. Allow the cows to have as much water as they will drink, and at all times keep the dog away from them. *Poultry*: Every farm runs poultry, but very few farmers regard them as a paying proposition; but poultry do pay and pay handsomely. Like all other stock, however, they have to be cared for and fed properly. There are very few farmers in this district who keep the birds confined in yards; in most cases they are allowed free range. I do not like to see fowls in a stable or implement shed—every machine a roosting place for the birds. Implements are expensive hen roosts. In the stable they are a source of annoyance to the horses, they rob the best of the feed and litter the manger with droppings and feathers. Free range birds get too fat and only lay a few misshapen and crinkley shelled eggs. Pen the birds in sufficiently large enclosures; have a good, well ventilated sleeping shed, free from draught; dispose of all surplus male birds, and feed with a system. A mash for the morning feed should consist of the following—5 parts pollard, 1 part bran, a little linseed meal or copra cake, a couple or three boiled rabbits, and 50 per cent. chaffed green lucerne. Feed as much green chaffed material as they will eat, a light midday meal of grain, and grain at night. Mix the mash the night before with the boiling rabbits and liquid; cover with a few bags and it will be warm for the morning feed. Provide plenty of scratching litter and always scatter the grain in the litter so that the birds have to work for it. Plenty of exercise keeps the birds healthy and increases the egg production. Clean, fresh drinking water should always be before the birds—see to this twice a day. Do not allow male birds to run with the flock, hens lay better without them. Keep the breeders in separate pens. Collect eggs several times a day. Have a good supply of shell grit in the nests; the hens will pick and eat the grit when they are on the nests for laying. Infertile eggs are the best sellers, and it is only when the birds are confined in yards and no male birds with them that one can market eggs guaranteed fresh and infertile. Three hundred birds kept this way will bring in sufficient capital to pay a lad to do the work and then show a good margin of profit."

RAMCO.

August 15th.—Present: eight members.

SEEPAGE.—Mr. F. Lewis read the following paper:—"Seepage in the horticultural blocks along the river is becoming such a serious matter, and is so little understood, that every opportunity should be taken to discuss the subject in the hope that some points may arise that will help the grower to effectively deal with it. In discussing the paper on this subject, read by Mr. Everett at the June Conference held at Waikerie, the opinion was expressed that seepage does not flow down a slope in a comparatively even sheet as surface flood water would, but gradually accumulates in a series of 'pockets.' These pockets become stagnant, and injurious to deep-rooted trees and vines, and the soil impregnated with salt. Very often these pockets are first indicated by luxuriant growth and large crops on account of the abundance of water at the correct depth, and if a drain is put down then to effectively keep the water at that level at all seasons, the seepage may be a blessing; but if neglected, the water-table naturally rises, with its injurious chemicals, and in time will kill the trees. If the 'pocket' theory is correct, then I cannot agree that to drain across the slope is the most effective, for two reasons: first, it is necessary to cut through the intervening 'banks' or 'waves' of impervious clay that are holding the seepage back from reaching the lower level where the main drains or well is situated. Second: If the drain pipes are across the slope, then there is nothing to prevent the flow of water from passing over above the drain, or even entering the top side of the pipes and passing straight through, if the lower end pipes are blocked. The best way, if possible, is to lay the pipes diagonally, to cover as much ground as possible with a given amount of piping, and also allow enough fall to keep the drain fairly clean. The more sumps that can be worked into the system the better, and one should certainly be placed at all junctions. These need not be expensive, and if built of corrugated iron outside a light framework of jarrah, will last for many years. I have used ordinary packing cases, and when treated with jodelite or creosote they are quite effective. In all cases the pipes should be threaded on good galvanised wire, and occasionally cleaned out by attaching a piece of chain to one end of the wire and another length of wire and pulling the chain through and back. Also the upper end of all pipelines should be brought to the surface, or to a sump, to supply ventilation and facilitate pulling the wire through." (Secretary, J. J. Odgers.)

SOUTH AND HILLS DISTRICT

CURRENCY CREEK.

September 19th.—Present: 11 members.

HANDLING THE YOUNG HORSE.—The Hon. Secretary (Mr. D. Gordon) read the following paper:—"Training should begin in early foalhood by first teaching the youngster to lead by a halter; the colt which has been taught to lead as a foal is much easier to break to harness at two or three years old than one which has never been handled. The main thing in teaching a colt to go in harness is to get it accustomed to the bridle, bit, collar, &c. Chains rattling are liable to startle a nervous youngster, and it it often advisable to use rope traces, unless bagging is placed round the chains—the latter is a good plan in any case, because it prevents chafing on legs and sides. Teach the colt to have confidence in its trainer; coax it rather than urge it unnecessarily with whip or rein. While having a firm hold of the reins, never pull or jerk them, this often causes injury to the mouth, besides making the colt resent having the bit put in its mouth. There is no better mate for a colt than a steady going old horse; the presence of a steady old plodder has a soothing and settling effect on the nervous youngster. It soon recognises that no harm is intended, that it is quite safe though the unaccustomed restraint of the harness is irritating. Drive the youngster around in a circle, near rein first, then change to the off one, but care should be taken not to make the colt's mouth harder on one side than the other. After it will answer to the rein it may be harnessed to a log with the old horse, but the load should be light until the colt is accustomed to putting his weight evenly in the collar. When advanced to the team put him next the near side horse on the hard ground for a start, changing him about as time goes on. Short hours and light work should be observed at first, in fact the better plan is to have two colts, and work them half a day each, always remember, if a good horse is to be reared, never knock the colt up. Always see that the collar fits properly; an ill-fitting collar causes sore shoulders, and may very often be the cause of the horse jibbing or rearing. Wash the colt's shoulders every night with salt and water, thus hardening them, and he will be less likely to get sores." (Secretary, D. Gordon.)

CROWN LANDS.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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All communications to be addressed:
"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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S. R. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

River Murray Swamp Areas.—At Murray Bridge, Thursday, February 16th (Secretary, Mr. Max Hoare).

Lower North, at Auburn (Wirilla Branch), Thursday, February 23rd. (Secretary, Mr. H. Schuncke, Box 4, Mandora.)

South-East, at Penola, Wednesday, March 8th.

Mid North, at Gladstone, Wednesday, March 15th. (Secretary, Mr. L. J. Sargent, Gladstone.)

Yorke Peninsula, at Stansbury (Weavers Branch), Wednesday, March 22nd. (Secretary, Mr. H. W. Cornish, Stansbury.)

South-East, at Bordertown (Tatiara Branch), Wednesday, April 5th. (Secretary, Mr. L. H. Butler, Bordertown.)

Dairying.—At Mount Barker, Thursday, May 11th (Secretary, Mr. P. Wise).

Each Conference will be opened at 10.30 a.m.

Linseed in the Lower North.

Replying to the Secretary of the Rosedale Branch of the Agricultural Bureau, who asked for information regarding the possibilities of linseed growing in the Lower North, the Deputy Director of Agriculture (Mr. W. J. Spafford) said:—

To secure good results linseed should be grown in districts well supplied with rain and having rather cool ripening weather in spring, and the chances are that the Rosedale district would not prove suitable for this crop.

In the two seasons 1919 and 1920 the crop was grown at the Turretfield Experimental Farm, at Rosedale, and although the growth each season was strong and vigorous, hot winds affected the crop of 1919, so that only 4bush. 38lbs. of seed per acre were harvested, and caterpillars were so plentiful at ripening time in 1920 that the yield of linseed was only 1bush. 15lbs. per acre.

Linseed is grown in much the same way as are the cereals. The land must be well prepared and in the autumn—April to early May—40lbs. to 60lbs. of seed are drilled in to the acre with 1cwt. to 1½cwts. of superphosphate. When ripe the crop is harvested with a reaper-thresher, or is cut with a binder, headed, and winnowed.

To get best results linseed needs a longer growing period and cooler ripening conditions than do most of the kinds of cereals we grow in this State, and so to have a reasonable chance of success must be sown early, even in our good agricultural districts.

Grass Hay and Ensilage Competitions.

The South Australian Advisory Dairy Board, in conjunction with the Department of Agriculture, is again promoting competitions for grass hay and ensilage amongst dairyfarmers in this State. Entries will be invited from dairymen in two districts, namely, the Hills and South-Eastern, and will be restricted to those who are milking not less than seven cows. Trophies and certificates will be awarded in each of the four competitions and successful competitors will receive prizes as under:—First, £3 3s. and certificate; second, £2 2s. and certificate; third, £1 1s. and certificate. Entries will close on February 1st, 1933, and the entrance fee is 1s. Entry forms can be obtained from the secretary, L. S. Smith, c/o office of Minister of Agriculture, Flinders Street, Adelaide.

Berri Experimental Orchard.

The practical interest taken by settlers along the irrigated areas of the River Murray in the work of the Berri Experimental Orchard was amply shown on Wednesday, December 8th, when 150 members of the Agricultural Bureau and others paid a visit of inspection under the auspices of the local Branch. The visitors included Messrs. J. B. Murdoch (Member Advisory Board of Agriculture), Geo. Quinn (Chief Horticultural Instructor), F. R. Arndt (Horticultural Instructor), and H. C. Pritchard (General Secretary Agricultural Bureau). The Manager (Mr. N. S. Fotheringham) conducted the party over the vineyard and orchard, and with the aid of type-written statements—copies of which were handed to those present—explained the objects and results of the experimental work in progress.

Field Day, Berri Experimental Orchard, December 7th, 1932.

In the evening Mr. E. R. Moss presided over a largely attended meeting, at which Mr. Quinn gave an address on Scale Insects and the uses of Fungicides and Insecticides.

Pasture Competitions.

The Pasture Competitions arranged by the South Australian Advisory Dairy Board resulted in 12 entries in the Central district and eight in the South-East, which were judged respectively by Messrs. R. Hill and E. S. Alcock (Agricultural Instructors). The entries were restricted to dairymen milking at least seven cows and to areas of not less than five acres. Mr. H. A. Woolley, of Mount Barker Junction, won the Central competition and the first prize in the South-Eastern competition went to Mr. F. C. Caine, of Kongorong.

In commenting on Mr. Woolley's entry Mr. Hill stated that it was really the outstanding pasture in that it was a good mixture, had been well handled, and not allowed to develop into a hay-cutting proposition early in the season. Although the field contained a mixture of Subterranean clover and perennial rye grass it had not been sown. The area was 20 acres, and portion was top dressed in 1918 with a ton of a special grass manure to 14 acres and it was then treated with 130lbs. of 45 per cent. superphosphate per acre annually for six years and, again in alternate years until 1930, since which year it had not received any fertiliser. It was a splendid pasture which carried a nice bite of feed for cattle. It was even and the grasses were not allowed to seed, but encouraged to stool and provide bright, clean, palatable and good quality feed. Subterranean clover, perennial rye grass, soft brome grass, barren brome grass, and silver grass were the main plants, and the whole field was remarkably free from weeds. Mr. Hill considered that the use of pasture harrows in future years would be an advantage.

Mr. Alcock described Mr. Caine's entry in the South-Eastern district as a fine paddock, which was sown down in 1928 with a mixture of 1lb. each of Subterranean clover, white clover, alsike clover, and cocksfoot grass and 10lbs. of Western District perennial rye grass. It was top dressed each year with 90lbs. of 45 per cent. super per acre and 1932 with 90lbs. of Portland blood and bone manure. Approximately 20 cows and 300 ewes and lambs have grazed on the area (35 acres) with the assistance of two other paddocks in the competition. The stock have been changed on these paddocks each week or fortnight since the previous shearing. The pasture consisted mainly of strawberry clover with rye grass, cocksfoot, and Yorkshire fog. White clover could also be seen as well as a little silver grass and sterile brome with odd spears of slender thistles, but mostly well under control. The paddock had been well managed and should provide a good bite for all the year.

The points allotted to the various competitors were as follows:—

Name and Address.	Position.	Bulk of Pasture available per Unit of Area.	Quality of Pasture.	Freedom from Useless Plants.	General Management.	Area Offered for Competition.	Total.
Maxima—	—	30	25	20	15	10	100
CENTRAL DISTRICT.							
H. A. Woolley, Mt. Barker Junction	1	25	22	19	14	6·60	86·60
E. H. Coote, Middleton ..	2	25	22	16	10	7·59	80·59
W. T. Vigar, Eden Valley	3	25	18	17	10	6·60	76·60
Mrs. A. D. Liebelt, Littlehampton	4	25	20	16	10	5·28	76·28
T. W. Roenfeldt, Greenock	5	22	20	14	13	6·93	75·93
Dunleith Pastoral Co., Ashbourne	6	15	20	18	10	1·98	74·98
J. B. E. Wright, Meningie	7	22	18	14	10	10·00	74·00
H. A. Woolley, Mt. Barker Junction	8	25	20	17	10	1·98	73·98
D. F. Sheppard, Prospect Hill	9	23	18	17	11	1·65	70·65
T. W. Roenfeldt, Greenock	10	15	18	15	13	5·94	66·94
Mrs. A. D. Liebelt, Littlehampton	11	20	18	14	11	1·98	64·98
A. Camens, Charleston ..	12	20	16	12	10	3·30	61·30
SOUTH-EASTERN DISTRICT.							
F. C. Caine, Kongorong ..	1	25	22	18	13	10	88
W. K. Chambers, Mil Lel	2	22	20	20	14	10	86
F. C. Caine, Kongorong ..	3	23	22	17	13	10	85
W. M. Laslett, Allandale .	4	21	21	19	13	4	78
J. L. Hoggart, Kalangadoo	5	22	19	16	11	10	78
F. C. Caine, Kongorong (2) c	—	22	20	15	11	10	78
O. Johnson, Tantanoola..	6	20	19	17	11	6	73
I. Sims, Glencoe	7	20	16	18	11	6	71

King Island Melilot.

The Botanical Assistant (Mr. E. W. Pritchard) makes the following comments on a plant submitted for identification by the Redhill Branch of the Agricultural Bureau:—The specimen is *Melilotus Indica* (King Island Melilot), an introduced annual from Europe, which is now fairly well spread over the older settled districts of the State. It is not poisonous. On the other hand, it is a very good fodder plant, being nutritious and fairly palatable to farm animals when once they have become accustomed to its strong odor and taste. Also it helps to renew the soil by the decay of its thick, deeply penetrating tap roots, which are thickly covered with the nodules of nitrogen-gathering bacteria. It has one disadvantage in wheat growing districts, in that the seed may be reaped with the wheat and remain in contact with it in the bags for some time. In that case the odor and flavor may be communicated to the wheat and to the flour and bread made from it, so as to make the bread unsaleable. But this can be prevented by properly adjusting the cleaning machinery in the reaper.

Peculiarity Noticed on Wheat Crops on Yorke Peninsula.

In the course of judging the entries in the Northern Yorke Peninsula Wheat Crop Competition this season, Mr. W. C. Johnston (Agricultural Instructor) noticed many crops exhibiting a decided and pronounced ''glisten'' on the chaff of the heads and the straw immediately below the ear.

After repeated examination the material causing this unusual feature was found to be of a sticky nature resembling a sugar solution which had partially dried. Its saccharine nature was further emphasised by its definitely sweet taste. Locally the phenomenon is known as ''Honey Dew,'' and older farmers of the district state that it makes its appearance spasmodically, recurring probably once in 20 years. No definite opinions were expressed as to the cause of its appearance, but it was unanimously agreed that the years when ''Honey Dew'' was in evidence were years when

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a good sample of grain would be harvested. There were exceptions this year, however, as the material might be found on crops which would undoubtedly return a pinched sample.

It was thought that some trouble would necessarily follow in the harvesting of the crops, and that unless very warm harvesting weather was experienced, this difficulty would be accentuated, as in the cooler weather the ''Honey Dew'' absorbs moisture, making the chaff and straw very tough, besides which it causes inconvenience by collecting on the combs and machinery parts.

Farmers believe that stock are very fond of the stubble from a crop exhibiting this feature.

No evidence of ''Honey Dew'' was found this season on the eastern side of the Hummocks, so that its appearance on the western side may be due to some climatic peculiarity.

Mr. Johnston states that he has so far been unable to find any literature in which this phenomenon is mentioned.

Wheat Varieties in South Australia.

At the Annual Congress held in September last Mr. R. C. Scott, in his paper, ''Wheat Varieties in South Australia,'' mentioned that the early records indicated that towards the middle of last century Red Straw, Club Head, Brodie's, and Goldsmith were the varieties commonly grown. As no mention was made in the records as to their origin, he thought that these wheats were probably imported from England. In the sixties red rust was particularly severe, and crops were badly affected. Purple Straw and Talavera eventually took the places of Brodie's and Goldsmith.

Mr. W. Gray, of Westbourne Park, has offered a few comments on the above remarks, and Mr. Scott considers them of interest, particularly in regard to the variety Goldsmith. Mr. Gray states that he does not remember the variety named Brodie's, but he recalls a club-eared wheat called Red Lammas (with a red tinted straw) and Talavera. He says that the wheat grown 70 years ago was Purple Straw, Tuscany, and Goldsmith (or Goldschmidt). The latter was a prolific, fine-milling wheat with a long ear. Mr. Gray's father (who was then farming near the Turretfield estate) obtained about two teacupsful of the seed from Mr. John Mitchell from wheat which had taken first prize at the Gawler Show. He planted it, and when it was ready for harvesting, cut off the ears, rubbed out the grain in his hands, and hand-planted it again. He had enough seed next year to broadcast an acre of ground. In time he had enough seed to sow at least a third of his land and to supply a bag to a neighbor. All went well until the rust year, 1868, when he had 35 acres that had lain fallow for years. The ears were more than a foot above the highest rise of the stripper comb, and the crop yielded less than a bushel to the acre. The grain was so shrivelled that the drake screen had to be covered, and millers would not take it at any price. The Purple Straw yielded 4bush. to the acre of marketable grain, and Tuscany 8bush. of plump grain. Goldsmith was sown for a few years later, but on account of its liability to rust it was discarded.

Mr. Scott states that he depended upon reports in the *Journal of Agriculture* and the *Garden and Field* for the information in his article on the early history of varieties grown. Mention was made in these publications of the popularity of Brodie's in the northern districts, but it apparently dropped out of cultivation, and up to a few years ago it was not included in the collection at Roseworthy College, a collection which totalled 600 varieties.

Publications Received.

''Beekeeping,'' Bulletin No. 9. Price, 1s. net.
''Farm Bookkeeping,'' Bulletin No. 58. Price, 6d. net.
''Rearing Chicks,'' Bulletin No. 54. Price, 6d. net.
Bulletins from Ministry of Agriculture, England.

TENTH AND CONCLUDING REPORT ON THE TURRETFIELD DEMONSTRATION FARM (1921-32) INCLUDING DETAILED ANALYSIS OF MEAN FARMING COSTS OVER THE SAME PERIOD.

[By Arthur J. Perkins, Director of Agriculture.]

(*Continued from page 545*).

PART II.—*continued.*

7. Costs of Wheat Growing at Turretfield.

A.—Wheat Sown on Bare Fallow.

"COSTS PER ACRE" AND "COSTS PER BUSHEL."

The interest of the average farmer in Mean "Costs" of growing Wheat tends to centre around "Costs per Bushel" rather than around "Costs per Acre," chiefly because whereas the former admits of immediate comparison with "Prices per Bushel," the latter involves a calculation in which "Mean Yields per Acre" must be taken into consideration. On the whole, it is regrettable that such should be the case, because, of the two, "Costs per Acre" in any given district are much the more stable over any given period. "Costs per Bushel" may be described as fluctuating values, controlled in the main by the following factors:—(1) Natural Soil characteristics; (2) Seasonal conditions; (3) Prevalence of Disease; and (4) the relative skill and good fortune of the farmer who tries to make the most of these four factors in any given season. In other words, relatively high or relatively low Mean "Costs per Bushel" depend primarily in any given season on mean yields per acre, or the extent to which the farmer is able to adapt his practice to environmental conditions of the time.

In this connection it is sometimes made a matter of reproach that we should not be able to state definitely and conclusively the Mean "Costs per Bushel" of growing Wheat in the Commonwealth. It would indeed be highly remarkable if we should have been able to do so, since even for a single farm we could not undertake to give definite figures in the matter without the careful study of records extending over an adequate number of seasons, and the results of single farms cannot be extended even to the districts in which they are placed, except with due caution and thorough knowledge of local conditions. How, then, can we be expected to state an acceptable "mean" for a State, let alone the Commonwealth as a whole? The fact of the matter is that in such considerations we have to deal not only with the vagaries of climate and soil, but with what is of equal consequence the difference in capacity of individual men.

It would be far simpler if the whole question were attacked from the angle of "Costs per Acre," which remain relatively stable, apart from violent economic changes, such as we have experienced recently. Once reasonable mean "Costs per Acre" have been adequately determined for a sufficiency of districts, corresponding "Costs per Bushel" could then be calculated on the basis of known local mean yields per acre after due allowance for consequent variations in harvest costs. If this were done throughout the Wheat growing areas, it should be possible, in the course of time by weighting the mean figures proportionately to the harvested areas to which they correspond, to determine fairly satisfactorily, not only mean "Costs per Bushel" in any given State, but in addition for the Commonwealth as a whole.

In the Tables that follow mean "Costs per acre" and mean "Costs per Bushel" at Turretfield have always been shown side by side, and it is hoped that the mean results of 10 successive seasons should suffice in either instance to smooth out unavoidable irregularities of occasionally exceptional conditions. Hence, it is believed that these "means" will give a sufficiently accurate representation of the Costs of Wheat growing in the Central and Lower North Farming Areas of the State over the past decade when the equivalent of unpaid Management and Family Labor is represented by actual Cash payments.

BIRD'S EYE VIEW OF TEN SEASONS.

In the first place, for purposes of comparison, I have summarised below in Table XIII., certain salient features of the successive seasons of the 1922-32 decade:—

TABLE XIII.

Some Salient Features in results registered for individual Seasons of the 1922-32 Decade.

Seasons.	Areas Harvested.	Mean Yield per Acre.	Mean "Costs."		Mean Cost of Eight-hour Day.	Mean Price Realised for Wheat.
			Per Acre.	Per Bush.		
	Acres.	Bush.	£ *s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
1922-23.......	203·53	15·08	4 1 11	5 5	9 3·4	4 10·3
1923-24.......	144·08	9·93	4 6 11	8 9	10 8·1	4 1·4
1924-25.......	349·32	23·91	4 11 9	3 10	9 7·1	6 0·4
1925-26	260·22	23·42	4 19 8	4 3	12 10·2	5 8·9
1926-27	369·06	19·33	4 15 2	4 11	12 11·2	5 5·7
1927-28	293·18	21·27	5 8 5	5 1	13 5·0	5 3·7
1928-29	407·56	18·38	5 2 1	5 7	11 5·0	4 8·6
1929-30	186·67	17·47	4 1 5	4 8	10 9·4	4 6·7
1930-31	437·08	18·79	4 3 3	4 5	9 8·8	1 8·5
1931-32	440·09	20·35	3 14 10	3 8	7 4·2	3 3·7
1922-32 Means.	308·98	19·49	4 10 8	4 8	10 4·6	4 6·2

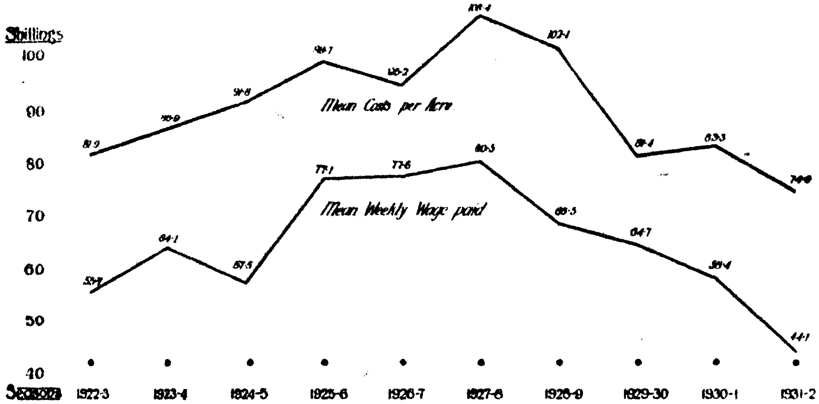
NOTE.—The price realised for Wheat in 1931-32, namely, 3s. 3.7d. per Bushel, includes 4½d. Federal Bounty.

Table XIII. shows that in the 1922-32 Decade the mean "Costs" of growing and harvesting a 309-acre Crop of Wheat, averaging 19½bush., was £4 10s. 8d. per acre and 4s. 8d. per Bushel respectively. Over the same period the average sum paid for wages for an eight-hour day was 10s. 5d. and the mean price realised for Wheat was 4s. 6d. per Bushel, that is to say, 2d. below mean inclusive costs of production.

I have already pointed out that the relative stability of "Costs per Acre" over a given period was connected with corresponding stability in the general economic position of the country over the same period. In this connection it must be admitted that in the 1922-32 decade the general economic position was very far from stable, and it is to this relative instability that we must attribute corresponding instability in "Costs per Acre" at Turretfield during this period. These "Costs" have fluctuated between £3 14s. 10d. (1931-32) and £5 8s. 5d. (1927-28), that is to say, to the extent of £1 13s. 7d. per acre, or an aggregate of 37.0 per cent. relatively to the mean of £4 10s. 8d. This relationship of general economic conditions and "Costs per Acre" can be illustrated by the progressive increase in the value of Wages and corresponding increase in "Costs per Acre." This has been done in the accompanying graph in which "Costs per Acre" expressed in shillings for each season have been contrasted with the mean value of the weekly wage in each corresponding season.

It will be observed that the two curves of the graph are very similar in character; both curves rise fairly steadily from 1922-23 to 1927-28, inclusively, which is the peak year, when "Costs per Acre" reached £5 8s. 5d. and the mean weekly wage 80s. 6d. From 1928-29 both Wages and "Costs per Acre" began to fall rapidly, reaching £3 14s. 10d. and 44s. 1d. in 1931-32. This relative parallelism of these two curves is all the more remarkable in that, as will be shown later on, the mean value of Wages in "Costs" of production of Wheat is somewhat less than 25 per cent., and that in any given year "Costs" of production per acre may, apart from any other considerations, be appreciably affected by seasonal conditions. It follows that the parallelism can be taken to have been assisted by corresponding falls in value of horse-feed, seed, and purchased materials.

Mean "Costs per Bushel" on the other hand, have varied not only with the trend of economic conditions, but also, and to an even greater extent, with seasonal conditions which have been limiting factors in the matter of mean yields per acre. These mean yields per acre have fluctuated between 9.93bush. (1923-4) and 23.91bush. (1924-5), with a decade mean of 19.49bush. The aggregate difference between maximum and minimum has therefore been nearly 14bush., or 71.7 per cent. relatively to the Decade Mean.



Comparison of Mean "Costs per acre" of Wheat at Turretfield with Mean Weekly wage paid.

Mean "Costs per Bushel" have varied between 3s. 8d. (1931-32) and 8s. 9d. (1923-4), that is to say, an aggregate difference of 5s. 1d. per Bushel, or 108.9 per cent. relatively to the Mean of 4s. 8d.

It will be observed, too, that in the 1922-32 decade in four seasons only, 1924-25, 1925-26, 1926-27, and 1927-28, did the prices realised for Wheat, namely, 6s. 0.4d., 5s. 8.9d., 5s. 5.7d., and 5s. 3.7d. exceed actual inclusive Costs of production per Bushel, namely, 3s. 10d., 4s. 3d., 4s 11d., and 5s. 1d., respectively. How such results would have affected farmers working on the basis of unpaid home Labor will be dealt with later on, when detailed statements of Costs come up for consideration.

DETAILED ANALYSIS OF "COSTS".

In Table XIV., that follows, a detailed analysis has been given of Mean Costs of growing Wheat sown on Bare Fallow at Turretfield in the 1922-32 decade: the mean area concerned was 308.98 acres and the Mean Yield 19.49bush.

TABLE XIV.

Detailed Analysis of 1922-32 *Mean Costs of growing Wheat sown on Bare Fallow on per acre and per bushel basis respectively.*

Mean area, 308.98 acres. Mean Yield per acre, 19.49bush.

1. MEAN COSTS PER ACRE.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.	Percentage.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	%
Tillage of Fallows	4 7·7	12 3·4	2 4·6	—	—	19 3·7	21·3
Seeding operations ...	1 8·2	3 4·8	1 0·8	—	—	6 1·8	6·8
Superphosphate	0 2·6	0 2·3	0 0·2	6 2·0	—	6 7·1	7·3
Seed	0 6·8	0 0·2	0 1·0	8 2·9	—	8 10·9	9·8
Totals	2 5·6	3 7·3	1 2·0	14 4·9	—	21 7·8	23·9
Spring Tillage	0 0·7	0 0·9	0 0·2	—	—	0 1·8	0·2
Harvest Operations ...	3 3·9	2 10·9	3 1·1	—	—	9 3·9	10·3
Bags	0 2·0	0 0·2	—	5 6·7	—	5 8·9	6·3
Sewing twine	—	—	—	0 1·0	—	0 1·0	0·1
Totals	3 5·9	2 11·1	3 1·1	5 7·7	—	15 1·8	16·7
General Expenses	6 0·9	0 2·8	0 4·5	—	3 5·5	10 1·7	11·2
Rates and Taxes......	—	—	—	—	1 2·9	1 2·9	1·3
Rent (18 months)	—	—	—	—	15 11·5	15 11·5	17·6
Interest on Working Capital	—	—	—	—	7 0·6	7 0·6	7·8
Totals	6 0·9	0 2·8	0 4·5	—	27 8·5	34 4·7	37·9
Grand Totals	16 8·8	19 1·5	7 0·4	20 0·6	27 8·5	90 7·8	—
Percentages	18·5%	21·1%	7·7%	22·1%	30·6%	—	100·0%

2. MEAN COST PER BUSHEL.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Tillage of Fallows -..............	0 2·9	0 7·5	0 1·5	—	—	0 11·9
Seeding operations..............	0 1·0	0 2·1	0 0·7	—	—	0 3·8
Superphosphate	0 0·1	0 0·1	—	0 3·8	—	0 4·0
Seed	0 0·4	—	—	0 5·1	—	0 5·5
Totals	0 1·5	0 2·2	0 0·7	0 8·9	—	1 1·3
Spring Tillage	—	0 0·1	—	—	—	0 0·1
Harvest operations	0 2·0	0 1·8	0 1·9	—	—	0 5·7
Bags	0 0·1	—	—	0 3·4	—	0 3·5
Sewing Twine..................	—	—	—	0 0·1	—	0 0·1
Totals	0 2·1	0 1·8	0 1·9	0 3·5	—	0 9·3
General Expenses	0 3·8	0 0·1	0 0·2	—	0 2·1	0 6·2
Rates and Taxes	—	—	—	—	0 0·8	0 0·8
Rent (18 months)	—	—	—	—	0 9·8	0 9·8
Interest on Working Capital	—	—	—	—	0 4·4	0 4·4
Totals	0 3·8	0 0·1	0 0·2	—	1 5·1	1 9·2
Grand Totals	0 10·3	0 11·7	0 4·3	1 0·4	1 5·1	4 7·8

Details concerning Costs of growing Wheat on a per acre and per bushel basis respectively, outlined in Table XIV., admit of being summarised under the headings of Statements A, B, and C given in Table XV. below:—

TABLE XV.

Summarising Mean Costs of growing Wheat at Turretfield during 10 successive seasons (1922-32), during the course of which the Mean Yield per acre was 19.49bush.

STATEMENT "A."

	Per Acre.			Per Bushel.		Percentage.
	£	s.	d.	s.	d.	%
Preparation of Fallows to March 31st	0	19	4	1	0	21·3
Seeding Operations	1	1	8	1	1	23·9
Harvest Operations	0	15	2	0	9	16·7
Incidental Expenditure	0	11	6	0	7	12·7
Interest on Working Capital	0	7	1	0	5	7·8
Rent (18 months)	0	15	11	0	10	17·6
Totals	4	10	8	4	8	100·0

STATEMENT "B."

	Per Acre.			Per Bushel.		Percentage.
	£	s.	d.	s.	d.	%
Labor (direct and indirect)	1	2	3	1	2	24·5
Use of Horses	0	15	2	0	9	16·7
Use of implements	0	5	6	0	3	6·1
Seed	0	8	3	0	5	9·1
Purchase of Essential Material	0	11	10	0	7	13·1
Balance of Expenditure	1	7	8	1	6	30·5
Totals	4	10	8	4	8	100·0

STATEMENT "C."

	Per Acre.			Per Bushel.		Percentage.
	£	s.	d.	s.	d.	%
Depreciation on Improvements and Plant	0	8	7	0	5	9·5
Interest on Land and Improvements	0	15	11	0	10	17·6
Interest on Floating Capital	0	6	0	0	4	6·6
Interest on Overdraft	0	1	1	0	1	1·2
Interest and Depreciation Charges	1	11	7	1	8	34·9
Balance of Expenditure	2	19	1	3	0	65·1
Totals	4	10	8	4	8	100·0

In Tables XIV. and XV. the mean "Costs" of growing Wheat sown on Bare Fallow at Turretfield during the 1922-32 decade have been set out in detail and from various angles. In this connection I shall call attention, among other things, to the following points:—

(*a*) In inclusive "Costs per Acre" of £4 10s. 8d. and inclusive "Costs per Bushel" of 4s. 8d. on a 19½bush. Harvest, £1 11s. 7d. per acre and 1s. 8d. per Bushel have represented respectively the value of Interest and Depreciation charges, that is to say, roughly one-third of the total Costs. Some English economists appear to believe that the latter charges are not relevant items in Costs of rural Production: and if we were to adopt such a viewpoint, which I do not, true "Costs" of growing Wheat at Turretfield would be reduced to £2 19s. 1d. per acre and 3s. per Bushel respectively. As to this viewpoint and the inferences that naturally derive from it all that I propose saying is that a farmer, working a Farm such as Turretfield, who chose to ignore Interest and Depreciation charges, and accepted 3s. per Bushel as adequately meeting his "Costs" of production, would be preparing for himself a rude awakening, probably in the Bankruptcy Courts.

(*b*) The actual costs of Field Operations were £2 16s. 2d. per acre and 2s. 10d. per bushel respectively, or approximately 62 per cent. of total Costs

(*c*) The "Costs" of Labor, both direct and indirect, were £1 2s. 3d. per acre and 1s. 2d. per Bushel, or 24½ per cent. of total "Costs"; that of the Use of Horses and Implements, £1 0s. 8d. per acre and 1s. 11d. per Bushel, or 22.8 per cent.;

that of Seed, 8s. 3d. per acre and 5d. per Bushel, or 9.1 per cent.; and that of the purchase of essential material, 11s. 10d. per acre and 7d. per Bushel, or 13.1 per cent.

(*d*) Rates and Taxes were 1s. 3d. per acre and ¾d. per Bushel, or 1.3 per cent. only of Total Costs.

THE RELEVANCY OF TURRETFIELD MEANS FOR GENERAL PURPOSES.

It is a matter of common knowledge that ever since the 1930-31 Season prices of Wheat, in common with those of most other forms of rural produce, have been abnormally low: so low indeed that in the opinions of those most competent to judge, local London parity prices of Wheat have not come within reach of Australian Mean Costs of Production since 1929-30, notwithstanding the doubtful advantage of a high adverse rate of Exchange. Hence, it is inevitable that two years of abnormally low prices, coming in on the heels of three years of drought, should have led to a good deal of hardship and distress among the farming community: and those so situated have naturally sought to draw attention to their plight, and have pressed for relief from the Federal authorities, who for the past 30 years have been the sponsors of the national policy of Australia, one of the natural consequences of which has been general enhancement in costs of rural production. Unfortunately, farmers who know instinctively that present receipts do not balance costs of production, lacking requisite data, are not always able to prove their cases adequately. In the circumstances, it is natural that Turretfield figures, the only authoritative ones available, should have been quoted, although at times perhaps without due discrimination. In opposition, it has been argued that Turretfield figures are not relevant to the position, and it seems wise therefore that I should endeavor to show to what extent I deem them relevant, and of value in the existing economic crisis.

In the first place, let me state that intrinsically facts and figures given in the present Report picture accurately Mean "Costs" incurred at Turretfield during the 1922-32 decade, and nothing more. I think, too, that I can claim that the Report will show how such data can be accumulated over a period of years, and the use that can be made of them in determining accurately mean "Costs" of various farming operations. Finally, I shall stress the fact that throughout these 10 years the farm has been well and economically farmed, and that for this in the main the credit and our thanks are due to the Manager, Mr. F. E. Waddy; hence, I am certain that there has been no enhancement of "Costs" on the score of extravagance or incompetency in management.

In the circumstances, after due consideration I am satisfied, that subject to certain limitations, Turretfield mean "Costing data" can be legitimately extended to other Farms, similarly situated as to soil and climatic conditions, even though the latter be normally worked on a basis of unpaid family Labor and 50 per cent. Capital ownership. After all, in final analysis, the difference between these two types of farms concerns in the main the closing Balance-sheet rather than the "*true* Costs" of individual farming operations. At Turretfield the full value of Wages and Interest dues had to be met in Cash, and when, as happened towards the end of the 1922-32 decade, as a result of low prices and unfavorable seasons, receipts proved insufficient to meet these charges and the balance of normal expenditure, the season closed on a Debit Balance: but, apart from temporary increase in interest dues on overdraft of succeeding seasons, this insufficiency of receipts did not in any way affect the value of "Costing data."

On the other hand, the average Farmer working his Farm in the main on a basis of unpaid family labor, may be said to be working for a Labor Income, which will be more or less great according to seasonal characteristics and prices offering at the time for rural products: and whilst he would naturally like to realise interest on his Capital investments as well, failure to do so would not necessarily from his point of view lead to a Debit Balance for the year's transactions. These facts do not, however, in any way affect the value of "Costs" incurred for individual Farm activities in which he may have been engaged, such as the growing of Wheat: if a true value is to be placed upon these "Costs," adequate allowance for the value of unpaid Family Labor will first have to be made, as well as for that of Interest and Depreciation on Capital engaged. This would place "*true* Costs" on an average Farm on the same footing as Turretfield costs: and it is for this reason that in my opinion Turretfield costing data hold good for farms similarly situated as to soil and climatic conditions in the 1922-32 decade.

I propose illustrating this point by a concrete example. Let us suppose that a farmer is working a farm of the Turretfield type mainly on a basis of unpaid family Labor, and that his Loan Liabilities represent 50 per cent. of the value of the fully-equipped property. On Turretfield figures the inclusive costs of growing and harvesting a 300-acre crop of Wheat would aggregate £1,360: in this total, Management and Labor would be represented by £334, and if we should allot £34 for casual hired Labor, £300 would represent the earnings of the Farmer and his Family. Corresponding total interest charges would be £345: but since one-half of this figure would be a book-keeping entry for Interest on the farmer's Personal Capital, interest charges actually paid in Cash would be reduced to £173. If, therefore, we deduct the combined value of the earnings of the farmer and his family and of interest on his Personal Capital from £1,360, total expenditure on 300 acres would be reduced to £888, or £2 19s. 2d. per acre, or again 3s. per Bushel on a 19½bush. harvest, instead of 4s. 8d., the Turretfield mean

Let it not be thought, however, that I mean to convey the impression that in the above example the farmer could afford to accept 3s. a bushel for his Wheat: indeed, if he had no other sources of Income even 3s. 6d. would not leave him £150 for the upkeep of himself and family: nor should it be forgotten that the latter sum would represent the combined earnings of the farmer, his family, and his Capital. Fortunately, the farmer has the advantage of a rent-free home, and can make his farm yield portion of the foodstuffs that he requires for personal use. Sidelines such as Dairy Cattle, Sheep, Pigs, Poultry, &c., can assist, too, to increase the general value of his Labor Income when main crops prove inadequate to the purpose. In times such as these, when thousands are out of employment, it seems to me that farmers must rest satisfied for the time being with a Labor Income that suffices to keep them on the land: in better times they have a right to claim at the very least that mean receipts should balance mean inclusive costs of their major operations, upon which depends the stability of the State.

THE INFLUENCE ON "COSTS" OF CHANGING ECONOMIC CONDITIONS.

It has been contended by some, with a very fair show of reason, that whilst the Turretfield "Mean Costs" might apply to mean conditions of the 1922-32 Decade, they do not correspond to present-day economic conditions. I am bound to recognise that this contention carries weight, and in order to meet it I propose using the means of the three seasons ending in 1931-32, during the course of which the economic changes referred to have made themselves felt. Data essential to the purpose have been summarised below in Table XVI..

TABLE XVI.

Summarising Mean Costs of Growing Wheat at Turretfield in 1922-29 *and* 1929-32 *periods respectively.*

	1922-1929. Mean Costs.			1929-1932. Mean Costs.		
	Per Acre.	Per Bushel.	Per-centage.	Per Acre.	Per Bushel.	Per-centage.
	£ *s.* *d.*	*s.* *d.*	%	£ *s.* *d.*	*s.* *d.*	%
Wages..............	1 4 0	1 3	24·9	0 18 9	1 0	23·6
Use of Horses	0 16 7	0 10	17·2	0 12 7	0 8	15·9
Use of Implements ..	0 6 5	0 4	6·6	0 3 9	0 2	4·7
Seed	0 9 0	0 5	9·3	0 6 9	0 4	8·5
Superphosphate	0 6 7	0 4	6·8	0 5 4	0 3	6·7
Bags	0 6 1	0 4	6·3	0 4 8	0 3	5·9
General Expenses ...	0 3 6	0 2	3·6	0 3 9	0 2	4·7
Rates and Taxes.....	0 1 2	0 1	1·2	0 1 4	0 1	1·7
Interest on Working Capital	0 7 2	0 4	7·4	0 6 9	0 4	8·5
Interest on Land and Improvements.....	0 16 1	0 10	16·7	0 15 9	0 10	19·8
Totals	4 16 7	4 11	100·0	3 19 5	4 1	100·0
Mean Yield per Acre.	19·64 Bushels.			19·20 Bushels.		

Table XVI. shows that whereas during the first seven years of the 1922-32 decade "Costs per Bushel" of a 19.64bush. harvest at Turretfield were at the rate of £4 16s. 7d. per acre and 4s. 11d. per bushel respectively, for a 19.20bush. harvest during the last three years of the decade these "Costs" fell to corresponding mean rates of £3 19s. 5d. and 4s. 1d., that is to say, a reduction of 17 to 18 per cent. Examination of the Table will show that reductions in costs have taken place under all headings itemised with the exception of interest and taxation. We were probably entitled to a reduction in interest rates, but did not claim it in view of the proposal to close down the farm.

I conclude therefore that at the present moment the probable "Costs of production" of a 20bush. Crop of Wheat in the Central or Lower North districts will vary between 3s. 8d. and 4s. per Bushel. It should not be forgotten, however, that "Costs per Bushel" are almost entirely governed by mean yields per acre, and that "Costs" rise when mean yields drop, and fall when mean yields rise. Thus, in similar circumstances and all other things being equal, whilst at Turretfield a 30bush. Crop would probably cost 2s. 9d. a Bushel, and a 25bush. Crop 3s. 3d., a 15bush. Crop would cost 5s. 2d., and a 10bush. Crop 7s. 7d. Nor should it be forgotten that the State Mean Yield is not yet 12bush. to the acre.

DIRECT AND INDIRECT LABOR.

In Statement "B" of Table XV. Labor is shown as direct and indirect, and of a combined value of £1 2s. 3d. per acre. By "direct" Labor in this connection is meant ordinary Field Labor responsible for preparation of the land and handling the Wheat crop at Seeding and Harvest time. "Indirect" Labor is taken to be Labor which enters into the general handling of Horses and Implements as indicated below:—

	1922-32 Means.		
	Per Acre.	Per Bushel.	Percentage of Total Costs.
	£ s. d.	s. d.	%
Direct Labor in Wheat Field	0 16 9	0 10·3	18·7
Indirect Labor (in use of Horses)	0 4 0	0 2·4	4·4
Indirect Labor (in use of Implements)............	0 1 6	0 0·9	1·6
Total Mean Value of Labor, "direct" and "indirect," in the growing of Wheat	1 2 3	1 1·6	24·7

LABOR ABSORBED BY WHEAT EXPRESSED AS DAYS PER ACRE.

The mean rate of payment of Labor at Turretfield in the 1922-32 decade has been at the rate of 1s. 3.57d. per hour, or 10s. 4½d. per eight-hour day. From this figure it is possible to calculate the number of Hours of Labor absorbed by the various Wheatgrowing field operations. These have been summarised below in Table XVII.:—

TABLE XVII.

Summarising Number of Hours per Acre absorbed by Wheat Growing Operations (1922-32 *Means*).

	"Costs."		Corresponding Hours.	
	s. d.	s. d.	Nos.	Nos.
Direct Labor—				
Tillage of Fallows	4 8		3·60	
Seeding Operations	2 5		1·86	
Spring Tillage	0 1		0·06	
Harvest Operations ...	3 6		2·70	
General Expenses......	6 1		4·69	
	——	16 9	——	12·91
Indirect Labor		5 6		4·24
Inclusive Total		22 3		17·15

Thus, then, at Turretfield 17.15 hours of Labor per Acre spread over 18 months have represented the mean requirements of Wheat grown on Bare Fallow over a period of 10 successive seasons, and as 9½ hours have represented the average farm day, the number of working days per 100 acres have been 181. Finally, if we look upon 307 working days to be available in a calendar year, one man could be responsible for 170 acres of Wheat under Turretfield conditions.

CONVEYANCE OF WHEAT FROM THE FARM TO RAILWAY SIDING.

The "Costs" of the Wheat Grower do not end in the harvest field; the grain has still to be conveyed to the Railway Siding. "Costs" of conveyance will naturally vary with the distances to be covered, and incidentally with the condition of the roads. Turretfield Wheat has, according to circumstances, been conveyed to market by our own teams or by the teams of Contractors. "Costs" of delivery of 23,970bush. by our own teams spread over several seasons have been as follows:—

	"Costs" Involved.	
	Total.	Per Bushel.
	£ s. d.	d.
Labor	94 15 3	0·9
Use of Horses	82 4 9	0·8
Use of Implements	7 10 9	0·1
Sundries	0 12 7	—
Costs of Conveying Wheat to Market	185 3 4	1·8

In 1927-28, Wheat was delivered by contract at 2.24d. per Bushel (5,624bush.); in 1928-29 at 1.93d. per Bushel (5,567bush.); and in 1929-30 at 1.5d. per Bushel (7,554bush.). If we average out the contract rates and the costs of Farm Carting, we get a mean rate of 1.86d. per Bushel, representing mean costs of conveying Wheat to Market at Turretfield.

Hence, over the past decade the mean "Costs" of growing and delivering Wheat to market at Turretfield have been 4s. 9.7d. per Bushel. On a per mile basis this represents 0.4d. per Bushel, or 1.2d. per bag, or, again, 1s. 2.9d. per ton.

B.—Wheat Sown on Pea Stubbles.

During the four seasons ending 1929-30, small areas of Wheat, averaging 33.22 acres per annum, were sown on Pea Stubbles of immediately preceding seasons. Costs incurred have been summarised in Table XVIII. below:—

TABLE XVIII.

Detailed Analysis of Expenditure incurred in Growing Wheat on Pea Stubbles (1926-30). *Mean Area,* 33.22 *acres.*

1. MEAN COSTS PER ACRE.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.	Percentage.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
Preparation of Land ..	2 10·1	4 4·5	1 0·6	—	—	8 3·2	12·2
Seeding Operations ...	1 6·8	3 4·1	1 0·1	—	—	5 11·0	8·7
Superphosphate	0 2·8	0 2·7	0 0·2	5 10·2	—	6 3·9	9·4
Seed	0 7·9	0 0·3	0 1·5	9 6·0	—	10 3·7	15·3
Totals	2 5·5	3 7·1	1 1·8	15 4·2	—	22 6·6	33·4
Spring Tillage	0 1·4	0 1·6	0 0·2	—	—	0 3·2	0·4
Harvest Operations ..	3 7·4	3 4·1	4 1·2	—	—	11 0·7	16·4
Bags	0 1·8	0 0·1	—	3 7·0	—	3 8·9	5·5
Sewing twine	—	—	—	0 0·8	—	0 0·8	0·1
Totals	3 9·2	3 4·2	4 1·2	3 7·8	—	14 10·4	22·0
General Expenses	4 6·0	0 1·5	0 3·8	—	2 11·8	7 11·1	11·7
Rates and Taxes	—	—	—	—	0 7·7	0 7·7	1·0
Interest on Working Capital	—	—	—	—	5 3·2	5 3·2	7·8
Interest on Land and Improvements (nine months)	—	—	—	—	7 9·5	7 9·5	11·5
Totals	4 6·0	0 1·5	0 3·8	—	16 8·2	21 7·5	32·0
Grand Totals.	13 8·2	11 6·9	6 7·6	19 0	16 8·2	67 6·9	—
Percentages	20·3%	17·1%	9·8%	28·1%	24·7%	—	100·0%

TABLE XVIII.—*continued.*

Detailed Analysis of Expenditure incurred in Growing Wheat on Pea Stubbles (1926-30). Mean Area, 33.22 Acres.

2. MEAN COSTS PER BUSHEL (15.94bush. per acre).

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Preparation of Land	0 2·1	0 3·3	0 0·8	—	—	0 6·2
Seeding Operations	0 1·2	0 2·5	0 0·8	—	—	0 4·5
Superphosphate	0 0·2	0 0·2	—	0 4·4	—	0 4·8
Seed	0 0·5	—	0 0·1	0 7·1	—	0 7·7
Totals	0 1·9	0 2·7	0 0·9	11·5	—	1 5
Spring Tillage	0 0·1	0 0·1	—	—	—	0 0·2
Harvest operations	0 2·7	0 2·5	0 3·1	—	—	0 8·3
Bags	0 0·1	—	—	0 2·7	—	0 2·8
Sewing Twine	—	—	—	0 0·1	—	0 0·1
Totals	0 2·8	0 2·5	0 3·1	0 2·8	—	0 11·2
General Expenses	0 3·4	0 0·1	0 0·2	—	0 2·2	0 5·9
Rates and Taxes	—	—	—	—	0 0·5	0 0·5
Interest on Working Capital	—	—	—	—	0 4·0	0 4·0
Interest on Land and Improvements (nine months)	—	—	—	—	0 5·9	0 5·9
Totals	0 3·4	0 0·1	0 0·2	—	1 0·6	1 4·3
Grand Totals	0 10·3	0 8·7	0 5·0	1 2·3	1 0·6	4 2·9

In Table XIX. that follows, mean expenditure incurred in growing Wheat on Pea Stubbles has been summarised below in comparison with corresponding expenditure of Wheat grown on Bare Fallow:—

TABLE XIX.

Contrasting Mean Expenditure on Wheat Grown on Pea Stubbles with corresponding Expenditure on Wheat Grown on Bare Fallow.

	Mean "Costs" of Wheat on Pea Stubbles, 1926-30.			Mean "Costs" of Wheat on Bare Fallow, 1922-32.		
	Per Acre.	Per Bushel.	Percentage.	Per Acre.	Per Bushel.	Percentage.
STATEMENT "A"—	£ s. d.	s. d.	%	£ s. d.	s. d.	%
Preparation of Land	0 8 3	0 6	12·2	0 19 4	1 0	21·3
Seeding Operations	1 2 7	1 5	33·4	1 1 8	1 1	23·9
Harvest Operations	0 14 10	0 11	22·0	0 15 2	0 9	16·7
Incidental Expenditure	0 8 10	0 7	13·1	0 11 6	0 7	12·7
Interest on Working Capital	0 5 3	0 4	7·8	0 7 1	0 5	7·8
Interest on Land and Improvements (9 or 18 months)	0 7 10	0 6	11·5	0 15 11	0 10	17·6
Totals	3 7 7	4 3	100·0	4 10 8	4 8	100·0
STATEMENT "B"—						
Labor (direct and indirect)	0 17 6	1 1	25·9	1 2 3	1 2	24·5
Use of Horses	0 9 5	0 7	13·9	0 15 2	0 9	16·7
Use of Implements	0 5 0	0 4	7·4	0 5 6	0 3	6·1
Seed	0 9 6	0 7	14·1	0 8 3	0 5	9·1
Purchase of Essential Material	0 9 6	0 7	14·1	0 11 10	0 7	13·1
Balance of Expenditure	0 16 8	1 1	24·6	1 7 8	1 6	30·5
Totals	3 7 7	4 3	100·0	4 10 8	4 8	100·0
STATEMENT "C"—						
Depreciation on Improvements and Plant	0 8 3	0 6	12·2	0 8 7	0 5	9·5
Interest on Land and Improvements	0 7 10	0 6	11·5	0 15 11	0 10	17·6
Interest on Floating Capital	0 4 10	0 4	7·8	0 6 0	0 4	6·6
Interest on Overdraft	0 0 5	—	—	0 1 1	0 1	1·2
Total Interest and Depreciation Charges	1 1 4	1 4	31·5	1 11 7	1 8	34·9
Balance of Expenditure	2 6 3	2 11	68·5	2 19 1	3 0	65·1
Totals	3 7 7	4 3	100·0	4 10 8	4 8	100·0
Mean Yields per Acre	15·94bush.			19·49bush.		

Table XVIII. shows that over a period of four seasons—1926-30—Mean "Costs per Acre" of Wheat sown on Pea Stubbles have been £3 7s. 7d. and Mean "Costs per Bushel" on a 15.94bush. Harvest 4s. 3d. Table XIX. shows that these figures represent decreases of £1 3s. 1d. per acre, or 25.5 per cent., and 5d. per Bushel, or 9.0 per cent., relatively to the 1922-32 Means of Wheat sown on Bare Fallow. This comparison, however favorable though it be, does not do full justice to Wheat sown on Pea Stubbles. The 1922-32 Means include three years during the course of which the economic position had led to appreciable decreases in costs of production, whereas the 1926-30 Means include one only, and that the least important of the three.

If, on the other hand, we contrast the Means of Wheat grown on Pea Stubbles with corresponding Means of Wheat grown on Bare Fallow over the same period, namely, 1926-30, the results are even more remarkable, as the following statement will show:—

	On Pea Stubble.	On Bare Fallow.	Decrease.	
			Total.	Percentage.
	£ s. d.	£ s. d.	£ s. d.	%
Mean Costs per Acre	3 7 7	4 18 6	1 10 11	31·4
Mean Costs per Bushel	0 4 3	0 5 2	0 0 11	17·7
Mean Yield per Acre	15·94bush.	19·20bush.	—	—

It follows, therefore, that at Turretfield Wheat sown on Pea Stubbles can be grown at considerably lower "Costs per Acre" than Wheat sown on Bare Fallow, and notwithstanding 17 per cent. reduction in mean yields per acre, at appreciably lower mean "Costs per Bushel." Whether, on the other hand, the Pease-Wheat rotation is likely in the aggregate to prove more profitable than the Bare Fallow-Wheat Rotation will depend very largely on the Pea Crop mean "Costs" and returns. This point will be discussed in a later section of the present report.

Main economies realised in the growing of Wheat on Pea Stubbles come under the following headings:—

(*a*) Reduced costs of preparation of the land—8s. 3d. per acre against 19s. 4d.

(*b*) Reduced interest on Land and Improvements—7s. 10d. per acre (nine months) against 15s. 11d. (18 months).

(*c*) Reduced interest on Working Capital—5s. 3d. per acre against 7s. 1d.

Finally, in Table XX. below I have contrasted Number of Working Hours required for Wheat sown on Pea Stubbles, on the one hand, with corresponding hours required for Wheat sown on Bare Fallow.

TABLE XX.

Contrasting Number of Hours per acre required for Wheat on Pea Stubbles, with Number for Wheat on Bare Fallow.

	Wheat on Pea Stubbles. 1926-30.				Wheat on Bare Fallow. 1922-32.			
	Costs at 1s. 4·23d. Per Hour.		Corresponding Hours.		Costs at 1s. 3·57d. Per Hour.		Corresponding Hours.	
	s. d.	s. d.	Nos.	Nos.	s. d.	s. d.	Nos.	Nos.
1. Direct Labor—								
Preparation of Land ..	2 10	—	2·10	—	4 8	—	3·60	—
Seeding Operations ...	2 6	—	1·82	—	2 5	—	1·86	—
Spring Tillage	0 1	—	0·09	—	0 1	—	0·06	—
Harvest Operations ...	3 9	—	2·78	—	3 6	—	2·70	—
General Expenses	4 6	13 8	3·33	10·12	6 1	16 9	4·69	12·91
2. Indirect Labor	—	3 10	—	2·82	—	5 6	—	4·24
Inclusive Totals	—	17 6	—	12·94	—	22 3	—	17·15

Table XX. shows that whereas Wheat on Bare Fallow required 17.15 hours of Labor (direct and indirect) per acre, Wheat on Pea Stubbles required 12.94 only. On the basis of a 9½ hour day for Farm Labor this would represent 181 days for 100 acres of Wheat on Bare Fallow against 136 days for 100 acres of Wheat on Pea Stubbles. This question will be considered in further detail when the Pea Crop is being dealt with.

8. "Costs" of Cereal Hay at Turretfield.

A.—Cereal Hay on Bare Fallow.

As has already been stated, in the opening years of the decade—1921-25—Cereal Hay was Turretfield's main Crop. From then onwards, however, the progressive displacement of light horses by motor cars and the disappearance of our Interstate trade in Chaff tended to render Hay growing for sale purposes more or less unprofitable. Hence, except in 1929-30, when, owing to drought conditions, there was a local shortage of Hay, Wheat harvested for grain has displaced Cereal Hay at Turretfield since 1925, and no more Hay has been cut than was actually required for Home purposes.

In the circumstances, the great bulk of our Hay has come from headlands and harvest roadways through our standing Wheat crops, and it follows that our handling costs have been greater than those of the normal Hay grower who is able to deal with large continuous areas. Such Costs, however, will have been no greater than those of the average Wheat farmer, who cuts Hay for home consumption only, and generally follows the same policy.

In Table XXI. mean Hay expenditure has been analysed in detail:—

Table XXI.

Detailed Analysis of Expenditure incurred in Growing Hay on Bare Fallow in 1922-32 decade.

1. MEAN "COSTS PER ACRE."

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.	Percentage.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	%
Tillage of Fallows	3 11·8	10 1·4	2 0·2	—	—	16 1·4	15·1
Seeding Operations ..	1 11·6	3 10·7	1 3·0	—	—	7 1·3	6·7
Superphosphate	0 2·6	0 2·7	0 0·2	6 9·8	—	7 3·3	6·8
Seed	0 6·5	0 0·1	0 0·8	8 3·3	—	8 10·7	8·3
Totals	2 8·7	4 1·5	1 4·0	15 1·1	—	23 3·3	21·8
Spring Tillage	0 1·7	0 2·1	0 0·6	—	—	0 4·4	0·3
Harvest Operations ...	14 10·2	6 7·3	5 2·4	0 0·2	—	26 8·1	25·0
Binder Twine	0 0·2	—	—	3 0·7	—	3 0·9	2·9
Totals	14 10·4	6 7·3	5 2·4	3 0·9	—	29 9·0	27·9
General Expenses	7 4·2	0 4·0	0 5·1	—	4 4·8	12 6·1	11·7
Rates and Taxes......	—	—	—	—	1 3·4	1 3·4	1·2
Interest on Land and Improvements......	—	—	—	—	16 0·5	16 0·5	15·0
Interest on Working Capital	—	—	—	—	7 5·5	7 5·5	7·0
Totals	7 4·2	0 4·0	0 5·1	—	29 2·2	37 3·5	34·9
Grand Totals	29 0·8	21 4·3	9 0·3	18 2·0	29 2·2	106 9·6	—
Percentages......	27·2%	20%	8·5%	17·0%	27·3%	—	100%

TABLE XXI.—*continued.*

Detailed Analysis of Expenditure incurred in Growing Hay on Bare Fallow in 1922-32 *Decade.*

2. MEAN "COSTS PER TON." Mean yield per acre, 1.80 tons.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	%
Tillage of Fallows	2 2·5	5 7·4	1 1·5	—	—	8 11·4
Seeding Operations	1 1·1	2 1·9	0 8·4	—	—	3 11·4
Superphosphate	0 1·5	0 1·5	0 0·1	3 9·4	—	4 0·5
Seed	0 3·6	0 0·1	0 0·4	4 7·2	—	4 11·3
Totals	1 6·2	2 3·5	0 8·9	8 4·6	—	12 11·2
Spring Tillage	0 0·9	0 1·2	0 0·3	—	—	0 2·4
Harvest Operations	8 3·0	3 8·1	2 10·6	0 0·1	—	14 9·8
Binder Twine	0 0·1	—	—	1 8·4	—	1 8·5
Totals	8 3·1	3 8·1	2 10·6	1 8·5	—	16 6·3
General Expenses	4 1·0	0 2·2	0 2·9	—	2 5·3	6 11·4
Rates and Taxes	—	—	—	—	0 8·5	0 8·5
Interest on Land and Improvements	—	—	—	—	8 10·9	8 10·9
Interest on Working Capital	—	—	—	—	4 1·7	4 1·7
Totals	4 1·0	0 2·2	0 2·9	—	16 2·4	20 8·5
Grand Totals	16 1·7	11 10·4	5 0·2	10 1·1	16 2·4	59 8·8

The detailed "Costs" of Table XXI. have been summarised below in Table XXII. under the usual statements "A," "B," and "C" in contrast with corresponding "Costs" of Wheat harvested for grain:—

TABLE XXII.

Summarising 10 *Seasons' Expenditure for Cereal Hay in comparison with corresponding Mean Figures for Wheat harvested as grain* (1922-32).

	Cereal Hay " Costs."			Wheat for Grain " Costs."		
	Per Acre.	Per Ton.	Percentage.	Per Acre.	Per Bushel.	Percentage.
STATEMENT " A "	£ *s. d.*	£ *s. d.*	%	£ *s. d.*	*s. d.*	%
Preparation of Land	0 16 1	0 9 0	15·1	0 19 4	1 0	21·3
Seeding Operations	1 3 3	0 12 11	21·8	1 1 8	1 1	23·9
Harvest Operations	1 9 9	0 16 6	27·9	0 15 2	0 9	16·7
Incidental Expenditure	0 14 2	0 7 10	13·2	0 11 6	0 7	12·7
Interest on Working Capital	0 7 6	0 4 2	7·0	0 7 1	0 5	7·8
Interest on Land and Improvements	0 16 1	0 8 11	15·0	0 15 11	0 10	17·6
Totals	5 6 10	2 19 4	100·0	4 10 8	4 8	100·0
STATEMENT " B "—						
Labor (direct and indirect)	1 15 6	0 19 8	33·2	1 2 3	1 2	24·5
Use of Horses	0 16 11	0 9 5	15·8	0 15 2	0 9	16·7
Use of Implements	0 7 0	0 3 11	6·6	0 5 6	0 3	6·1
Seed	0 8 3	0 4 7	7·7	0 8 3	0 5	9·1
Purchase of Essential Material	0 9 10	0 5 6	9·2	0 11 10	0 7	13·1
Balance of Expenditure	1 9 4	0 16 3	27·5	1 7 8	1 6	30·5
Totals	5 6 10	2 19 4	100·0	4 10 8	4 8	100·0
STATEMENT " C "						
Depreciation on Improvements and Plant	0 9 8	0 5 5	9·1	0 8 7	0 5	9·5
Interest on Land and Improvements	0 16 1	0 8 11	15·0	0 15 11	0 10	17·6
Interest on Floating Capital	0 6 10	0 3 10	6·4	0 6 0	0 4	6·6
Interest on Overdraft	0 0 7	0 0 4	0·5	0 1 1	0 1	1·2
Interest and Depreciation Charges	1 13 2	0 18 6	31·0	1 11 7	1 8	34·9
Balance of Expenditure	3 13 8	2 0 10	69·0	2 19 1	3 0	65·1
Totals	5 6 10	2 19 4	100·0	4 10 8	4 8	100·0
Mean Yields per acre	1⅘ tons			19¼bush.		

I have already pointed out that the practice of securing our Hay in the main from headlands and roadways of crops to be harvested for grain has had the effect of increasing both the "Costs per acre" and the "Costs per ton." The preceding two Tables show 1922-32 Costs to have been £5 6s. 10d. and £2 19s. 4d. respectively for a 1-4/5 ton crop of Hay. The contrast of corresponding "Costs" of a 19¼bush. Crop of Wheat, namely, £4 10s. 8d. and 4s. 8d. respectively, is striking.

The difference between mean "Costs per Acre" of Hay and Wheat respectively was therefore represented by 16s. 2d., or nearly 18 per cent. of the "Costs" of Wheat. Harvesting "Costs," which include Binding, Stooking, Carting, and Stacking, namely, £1 9s. 9d. per acre against 15s. 2d. for corresponding Wheat Harvesting "Costs," are mainly responsible for the increase, namely, 14s. 7d. per acre. Similarly in the Hayfield, harvest "Costs" are represented mainly by Labor: hence, Hay growing absorbed £1 15s. 6d. per acre for Labor as against £1 2s. 3d. for Wheat, representing an increase of 13s. 3d. per acre, or nearly 15 per cent. of total Wheat Costs.

Unfortunately, Hay growers generally have been slow to recognise that the metropolitan market for Hay has been reduced to very small proportions, and continue to cut their crops for Hay almost as liberally as in the early years of the century, with the inevitable consequence that prices offering for Hay have for the past seven or eight years been considerably below "Costs" of production. And although farmers generally seek to reduce Harvest "Costs" by selling their Hay in the stook this does not improve matters very much. Mean costs of Carting and Stacking Hay at Turretfield during the past 10 years are shown below in tabular form:—

Seasons.	Hay Carted and Stacked in the Field.	Total "Costs."	"Costs" per Ton.
	Tons.	£ s. d.	s. d.
1922–23	489·30	144 16 8	5 11
1923–24	56·50	32 0 9	11 4
1924–25	230·00	93 12 6	8 2
1925–26	219·50	118 12 11	10 10
1926–27	122·50	69 7 1	11 4
1927–28	175·00	85 8 8	9 9
1928–29	77·00	43 10 9	11 4
1929–30	317·00	170 8 10	10 9
1930–31	201·60	84 5 5	8 4
1931–32	74·50	25 7 4	6 10
1922–32 Means	196·29	86 15 1	8 10

Thus, if from Mean Costs of Hay in the stack—£2 19s. 4d. per ton—we deduct 8s. 10d. for carting and stacking, we get £2 10s. 6d. per ton for costs of Hay in the stook, which is still very considerably above mean prices offering at harvest time of recent years.

Again, it may be argued that a mean yield of 1-4/5 tons per acre is low, and therefore costly: and whilst this argument cannot be accepted for the average farmer, it is probably true of the professional Hay grower. But, if the yield per acre were higher, harvest costs per acre would also be higher. If we assume the mean yield per acre to have been 3 tons, increased harvest costs would be as follows:—

Increased Harvest Costs per Acre for 3-ton Crop—
= 1.2 tons at 16s. 6.3d. per ton = 19s. 10d.

This would raise "Costs per acre" of Hay in the Stack to £6 7s. 8d., but reduce "Costs per ton" to £2 2s. 7d. in the stack, which is still above current prices offering: and even "Costs per ton" in the stook would still be £1 13s. 9d.

My personal conviction is that if anything is to be made out of the sale of hay as a business proposition 50 per cent. of the land at present sown to Hay for sale must be put to some other use.

It can be said for Hay growing that it offers greater scope for employment of Labor than Wheat Growing, as Table XXIII. will show:—

Table XXIII.

Comparative Statement of Working Hours per acre absorbed by Hay and Wheat growing respectively.

	Hay Growing.				Wheat Growing.			
	Hours of Labor.				Hours of Labor.			
	Costs.		Corresponding Hours.		Costs.		Corresponding Hours.	
Direct Labor—	*s. d.*	*s. d.*	Nos.	Nos.	*s. d.*	*s. d.*	Nos.	Nos.
Tillage of Fallows	4 0		3·07		4 8		3·60	
Seeding Operations	2 9		2·10		2 5		1·86	
Spring Tillage	0 2		0·11		0 1		0·06	
Harvest Operations	14 10		11·46		3 6		2·70	
General Expenses	7 4		5·66		6 1		4·69	
		29 1		22·40		16 9		12·91
Indirect Labor—		6 5		4·93		5 6		4·24
Totals		35 6		27·33		22 3		17·15
Number of 9½ Hour Days per Acre			2·88 days				1·81 days	

It follows that whereas at Turretfield one acre of Wheat harvested for grain absorbed 17.15 hours of Labor, or 1.81 working days, a corresponding acre of Hay in the Stack absorbed 27.33 Hours, or 2.88 working days. The heavy requirements of a Hay crop at harvest time—11.46 hours per acre—are in striking contrast with those of Wheat harvested for grain—2.70 hours per acre only.

B.—Cereal Hay Sown on Stubble Land.

Small areas of stubble land have been sown to Oats at Turretfield and subsequently cut for Hay: mean expenditure incurred in this connection for 1923-31 period (eight years) has been analysed below in Table XXIV.:—

Table XXIV.

Detailed Analysis of Expenditure incurred for Cereal Hay sown on Stubble land, 1923-31.

Mean Area, 37.73 acres. Mean Yield per acre, 1.35 tons.

1. MEAN COSTS PER ACRE.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.	Percentage.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	%
Preparation of Land ..	2 1·4	3 2·0	0 8·8	—	—	5 11·7	8·3
Seeding Operations ...	1 4·8	2 10·1	1 0·8	—	—	5 3·7	7·3
Superphosphate	0 1·8	0 1·9	0 0·1	4 5·6	—	4 9·4	6·6
Seed	0 5·1	0 0·6	0 0·6	7 1·8	—	7 8·1	10·6
Totals	1 11·7	3 0·6	1 1·5	11 7·4	—	17 9·2	24·5
Spring Tillage	0 4·4	0 5·8	0 1·4	—	—	0 11·6	1·3
Harvest Operations ...	13 6·2	5 8·9	4 9·2	0 0·8	—	24 1·1	33·3
Binder Twine	0 0·5	0 0·2	0 0·3	2 7·1	—	2 8·1	3·7
Totals	13 6·7	5 9·1	4 9·5	2 7·9	—	26·9 2	37·0
General Expenses	4 2·2	0 2·2	0 3·0	—	2 7·9	7 3·3	10·1
Rates and Taxes......	—	—	—	—	0 7·6	0 7·6	0·9
Interest on Working Capital	—	—	—	—	5 0·5	5 0·5	7·0
Interest on Land and Improvements (nine months)	—	—	—	—	7 10·1	7 10·1	10·9
Totals	4 2·2	0 2·2	0 3·0	—	16 2·1	20 9·5	28·9
Grand Totals	22 2·4	12 7·7	6 11·7	14 3·3	16 2·1	72 3·2	—
Percentages	30·7%	17·5%	9·6%	19·8%	22·4%	—	100·0

TABLE XXIV.—*continued.*

Detailed Analysis of Expenditure incurred for Cereal Hay Sown on Stubble Land, 1923-31.

2. MEAN COSTS PER TON.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Totals.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Preparation of Land	1 6·8	2 4·1	0 6·1	—	—	4 5·0
Seeding Operations	1 0·4	2 1·2	0 9·4	—	—	3 11·0
Superphosphate	0 1·3	0 1·4	0 0·1	3 3·6	—	3 6·4
Seed	0 3·7	0 0·5	0 0·5	5 3·3	—	5 8·0
Totals	1 5·4	2 3·1	0 10·0	8 6·9	—	13 1·4
Spring Tillage	0 3·3	0 4·3	0 1·0	—	—	0 8·6
Harvest Operations	9 11·7	4 2·9	3 6·2	0 0·6	—	17 9·4
Binder Twine	0 0·4	0 0·1	0 0·2	1 11·0	—	1 11·7
Totals	10 0·1	4 3·0	3 6·4	1 11·6	—	19 9·1
General Expenses	3 1·1	0 1·6	0 2·3	—	1 11·5	5 4·5
Rates and Taxes	—	—	—	—	0 5·6	0 5·6
Interest on Working Capital	—	—	—	—	3 8·7	3 8·7
Interest on Land and Improvements (nine months)	—	—	—	—	5 9·4	5 9·4
Totals	3 1·1	0 1·6	0 2·3	—	11 11·2	15 4·[illegible]
Grand Totals	16 4·7	9 4·1	5 1·8	10 6·5	11 11·2	53 4·3

Costs of growing Cereal Hay on Stubbles as indicated in Table XXIV. naturally challenge comparison with corresponding Costs for Hay grown on Bare Fallow. In this connection, comparative costs have been shown below in Table XXV. under Statements "A," "B," and "C."

TABLE XXV.

Contrasting Costs of Cereal Hay sown on Stubble Land (1923-31), *with Corresponding Costs for Cereal Hay sown on Bare Fallow* (1922-32).

	Stubble Hay (1923-31). Mean Costs.			Bare Fallow Hay (1922-32) Mean Costs.		
	Per Acre.	Per Ton.	Percentage.	Per Acre.	Per Ton.	Percentage.
STATEMENT "A"—	£ s. d.	s. d.	%	£ s. d.	s. d.	%
Preparation of Land	0 6 0	4 5	8·3	0 16 1	9 0	15·1
Seeding Operations	0 17 9	13 1	24·5	1 3 3	12 11	21·8
Harvest Operations	1 6 9	19 9	37·0	1 9 9	16 6	27·9
Incidental Expenditure	0 8 11	6 7	12·3	0 14 2	7 10	13·2
Interest on Working Capital	0 5 0	3 9	7·0	0 7 6	4 2	7·0
Interest on Land and Improvements (9 or 18 months)	0 7 10	5 9	10·9	0 16 1	8 11	15·0
Totals	3 12 3	53 4	100·0	5 6 10	59 4	100·0
STATEMENT "B"—						
Labor (direct and indirect)	1 6 2	19 4	36·2	1 15 6	19 8	33·2
Use of Horses	0 10 2	7 6	14·1	0 16 11	9 5	15·8
Use of Implements	0 5 6	4 1	7·6	0 7 0	3 11	6·6
Seed	0 7 2	5 3	9·9	0 8 3	4 7	7·7
Purchase of Essential Material	0 7 1	5 3	9·8	0 9 10	5 6	9·2
Balance of Expenditure	0 16 2	11 11	22·4	1 9 4	16 3	27·5
Totals	3 12 3	53 4	100·0	5 6 10	59 4	100·0
STATEMENT "C"—						
Interest on Land and Improvements	0 7 10	5 9	10·9	0 16 1	8 11	15·0
Interest on Floating Capital	0 4 6	3 4	6·2	0 6 10	3 10	6·4
Interest on Overdraft	0 0 6	0 5	0·8	0 0 7	0 4	0·5
Depreciation on Improvements and Plant	0 6 2	4 7	8·5	0 9 8	5 5	9·1
Interest and Depreciation charges	0 19 0	14 1	26·4	1 13 2	18 6	31·0
Balance of Expenditure	2 13 3	39 3	73·6	3 13 8	40 10	69·0
Totals	3 12 3	53 4	100·0	5 6 10	59 4	100·0
Mean Yields per Acre	1·35 tons			1·80 tons		

Table XXV. shows, as might have been anticipated, that the mean "Costs per acre" of growing Hay on Stubble land—£3 12s. 3d.—are considerably less—£1 14s. 7d. per acre, or 32.4 per cent.—than corresponding Mean "Costs" of Hay sown on Bare Fallow—£5 6s. 10d. Statement "A" shows the main difference to be connected with reduction in costs of preparation of the land and of interest on Land and Improvements, namely, 13s. 10d. and 32s. 2d. in the aggregate respectively. Under Statement "B" main reductions are shown to come under Labor and Use of Horses, namely, £1 16s. 4d. and £2 12s. 5d. in the aggregate respectively. Finally, Statement "C" shows inclusive Interest and Depreciation charges to be 19s. for Hay on Stubbles and 33s. 2d. for Hay on Bare Fallow.

On the other hand, with a difference of nearly half a ton to the acre in favor of Hay on Bare Fallow, it is a matter of surprise that Mean "Costs per ton" of the latter—£2 19s. 4d.—should have been 6s. or 11.3 per cent. higher than corresponding "Costs" of Hay grown on Stubbles. This difference is probably connected with the fact that Bare Fallow Hay was in the main harvested from roadways and headlands, whereas Stubble Hay was harvested from a continuous field.

In Table XXVI. the mean number of Hours of Labor absorbed respectively by Hay grown on Bare Fallow and on Stubble land have been shown:—

TABLE XXVI.

Contrasting Number of Hours of Labor per Acre absorbed by Hay grown on Bare Fallow and Stubble Land respectively.

	Stubble Hay.				Bare Fallow Hay.			
	"Costs" of Labor.		Corresponding Hours.		"Costs" of Labor.		Corresponding Hours.	
	s. d.	s. d.	Nos.	Nos.	s. d.	s. d.	Nos.	Nos.
Direct Labor—								
Preparation of Land	2 1		1·56		4 0		3·07	
Seeding Operations	2 0		1·50		2 9		2·10	
Spring Tillage	0 4		0·25		0 2		0·11	
Harvest Operations	13 7		10·15		14 10		11·46	
General Expenses	4 2		3·11		7 4		5·66	
		22 2		16·57		29 1		22·40
Indirect Labor		4 0		2·99		6 5		4·93
Totals		26 2		19·56		35 6		27·33

No. of 9½-hour days .. 2·06 per acre 2·88 per acre.

Hence, Hay grown on Fallow absorbed 0.82 days per acre more than Hay grown on Stubble land.

9. COSTS OF OATS AND BARLEY AS STUBBLE CROPS.

Neither Oats nor Barley for grain were availed of extensively in Turretfield Rotations, and neither crop was harvested for grain later than 1926-27. Mean Costs incurred have been summarised on next page under the usual statements "A," "B," and "C".

TABLE XXVII.

Summarising Mean Costs of growing Oats and Barley respectively as Stubble Sown Crops.

	Oats "Costs."			Barley "Costs."		
	Per Acre.	Per Bushel.	Per-centage.	Per Acre.	Per Bushel.	Per-centage.
STATEMENT "A"—	*s. d.*	*s. d.*	%	*s. d.*	*s. d.*	%
Preparation of Land	5 3	0 3	9·5	9 1	0 6	17·5
Seeding Operations	16 5	0 9	29·7	13 4	0 9	25·5
Harvest Operations	15 7	0 9	28·2	12 2	0 9	23·4
Incidental Expenditure	6 7	0 4	11·9	6 3	0 4	12·0
Interest on Working Capital	3 8	0 2	6·6	3 2	0 2	6·1
Interest on Land and Improvements (9 months)	7 10	0 4	14·1	8 1	0 6	15·5
Totals	55 4	2 7	100·0	52 1	3 0	100·0
STATEMENT "B"—						
Labor (direct and indirect)	15 4	0 9	27·7	14 11	0 10	28·7
Use of Horses	7 9	0 4	14·0	9 6	0 7	18·2
Use of Implements	6 2	0 4	11·2	4 2	0 3	8·0
Seed	6 5	0 4	11·6	3 11	0 3	7·5
Purchase of Essential Material	6 0	0 3	10·9	6 5	0 5	12·3
Balance of Expenditure	13 8	0 7	24·6	13 2	0 8	25·3
Totals	55 4	2 7	100·0	52 1	3 0	100·0
STATEMENT "C"—						
Depreciation on Improvements and Plant	7 8	0 4	13·8	5 10	0 4	11·2
Interest on Land and Improvements	7 10	0 4	14·1	8 1	0 5	15·5
Interest on Floating Capital	3 4	0 2	6·6	2 11	0 2	6·1
Interest on Overdraft	0 4	—	—	0 3	—	—
Interest and Depreciation Charges	19 2	0 10	34·5	17 1	0 11	32·8
Balance of Expenditure	36 2	1 9	65·5	35 0	2 1	67·2
Totals	55 4	2 7	100·0	52 1	3 0	100·0
	Acres.			Acres.		
Mean Area Sown	83·6			95·87		
	Bush.			Bush.		
Mean Yield per Acre	21·22			17·26		

The mean number of Working Hours per acre absorbed respectively by a Crop of Oats and a Crop of Barley has been shown below in Table XXVIII.:—

TABLE XXVIII.

Summarising Mean Working Hours per Acre absorbed by Oats and Barley respectively.

	Oats.				Barley.			
	"Costs" of Labor per Acre.		Corresponding Hours of Labor.		"Costs" of Labor per Acre.		Corresponding Hours of Labor.	
	s. d.	*s. d.*	Nos.	Nos.	*s. d.*	*s. d.*	Nos.	Nos.
Direct Labor—								
Preparation of Land	1 5		1·05		2 3		1·65	
Seeding Operations	2 1		1·55		1 5		1·06	
Spring Tillage	0 1		0·03		0 1		·08	
Harvest Operations	4 5		3·29		4 2		3·05	
General Expenses	3 11		2·92		3 6		2·61	
		11 11		8·84		11 5		8·45
Indirect Labor		3 5		2·50		3 6		2·58
Totals		15 4		11·34		14 11		11·03
Mean Number of 9½-hour Days per 100 acres			119 days				116 days	

10. Costs of Growing Pease on Stubble Land as a Fallow Crop Preceding Wheat or Cereal Hay.

In the Central and Lower North Divisions of the State, Field Pease have within recent years been grown fairly extensively in rotation with Wheat or Cereal Hay. This practice was under observation at Turretfield between 1924-25 and 1929-30 seasons inclusively. Unfortunately, out of these six Seasons, two only proved favorable to Pease, which in the remaining four seasons suffered either from unfavorable weather conditions or from attacks of Caterpillars. Hence, in the matter of Mean Yields per acre, it cannot be said that Turretfield figures do full justice to the possibilities of Field Pease as a suitable Fallow Crop for the district. What these Mean Yields have been in each season have been shown below in summarised form:—

	Area Harvested.	Mean Yields per Acre.
	Acres.	Bushels.
1924-25	28·40	23·57
1925-26	37·18	6·42
1926-27	35·08	23·92
1927-28	5·00	3·00
1928-29	27·47	3·45
1929-30	9·50	3·16
1924-30 Means	23·77 acres	13·23 bushels

The mean yield of the six seasons was therefore 13¼bush., whereas the normal mean usually approaches 20bush.

In Table XXIX. Mean Expenditure incurred during these six seasons has been analysed in detail:—

Table XXIX.

Detailed Aanlysis of Mean Expenditure incurred in Growing Field Pease (1924-30).

1. MEAN COSTS PER ACRE—23.27 ACRES.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Total.	Percentage.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	%
Preparation of Land	2 4·9	6 3	1 1·2	—	—	9 9·1	12·2
Seeding Operations	2 5·4	4 1·6	1 5·8	—	—	8 0·8	10·1
Superphosphate	0 2·7	0 3	0 0·2	5 8·3	—	6 2·2	7·7
Seed	0 8·1	0 1·6	0 0·8	13 8·2	—	14 6·7	18·2
Totals	3 4·2	4 6·2	1 6·8	19 4·5	—	28 9·7	36·0
Spring Tillage	0 0·6	0 0·7	—	—	—	0 1·3	0·1
Harvest Operations	3 11·9	5 4·1	6 8·9	—	—	16 0·9	20·1
Bags	0 4·2	0 0·1	—	2 1·9	—	2 6·2	3·1
Sewing Twine	—	—	—	0 0·7	—	0 0·7	0·1
Totals	4 4·1	5 4·2	6 8·9	2 2·6	—	18 7·8	23·3
General Expenses	5 6·6	0 3	0 4·7	—	2 8	8 10·3	11·1
Rates and Taxes	—	—	—	—	0 7·2	0 7·2	0·7
Interest on Working Capital	—	—	—	—	5 8·3	5 8·3	7·1
Interest on Land and Improvements (nine months)	—	—	—	—	7 6·7	7 6·7	9·5
Totals	5 6·6	0 3	0 4·7	—	16 6·2	22 8·5	28·4
Grand Totals	15 8·4	16 5·1	9 9·6	21 7·1	16 6·2	80 0·4	—
Percentages	19·6%	20·6%	12·2%	26·2%	21·4%	—	100·0%

TABLE XXIX.—*continued.*

Detailed Analysis of Mean Expenditure incurred in Growing Field Pease (1924-30).

2. MEAN COSTS PER BUSHEL—13¼BUSH. PER ACRE.

	Labor.	Horses.	Implements.	Material.	Miscellaneous.	Total.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Preparation of Land	0 2·2	0 5·7	0 1·0	—	—	0 8·9
Seeding Operations	0 2·2	0 3·8	0 1·3	—	—	0 7·3
Superphosphate	0 0·2	0 0·2	—	0 5·2	—	0 5·6
Seed	0 0·6	0 0·1	0 0·1	1 0·4	—	1 1·2
Totals	0 3·0	0 4·1	0 1·4	1 5·6	—	2 2·1
Spring Tillage	—	0 0·1	—	—	—	0 0·1
Harvest Operations	0 3·6	0 4·8	0 6·1	—	—	1 2·5
Bags	0 0·4	—	—	0 1·9	—	0 2·3
Sewing Twine	—	—	—	0 0·1	—	0 0·1
Totals	0 4·0	0 4·8	0 6·1	0 2·0	—	1 4·9
General Expenses	0 5·0	0 0·2	0 0·4	—	0 2·4	0 8·0
Rates and Taxes	—	—	—	—	0 0·5	0 0·5
Interest on Working Capital	—	—	—	—	0 5·2	0 5·2
Interest on Land and Improvements (nine months)	—	—	—	—	0 6·9	0 6·9
Totals	0 5·0	0 0·2	0 0·4	—	1 3·0	1 8·6
Grand Totals	1 2·2	1 2·9	0 8·9	1 7·6	1 3·0	6 0·6

Finally, mean Costs of growing Pease at Turretfield have been summarised below in Table XXX. under the usual statements "A," "B," and "C."

TABLE XXX.

Summarising 1924-30 *Costs of Production of Field Pease.*

	Per Acre.	Per Bushel.	Percentage.
STATEMENT A—	£ *s. d.*	*s. d.*	%
Preparation of the Land	0 9 9	0 9	12·2
Seeding Operations	1 8 10	2 2	36·0
Harvest Operations	0 18 8	1 5	23·3
Incidental Expenditure	0 9 6	0 9	11·9
Interest on Working Capital	0 5 8	0 5	7·1
Interest on Land and Improvements	0 7 7	0 7	9·5
Totals	4 0 0	6 1	100·0
STATEMENT "B"—			
Labor (direct and indirect)	1 1 0	1 7	26·2
Use of Horses	0 13 4	1 0	16·7
Use of Implements	0 7 7	0 7	9·5
Seed	0 13 8	1 1	17·1
Purchase of Essential Material	0 7 11	0 7	9·9
Balance of Expenditure	0 16 6	1 3	20·6
Totals	4 0 0	6 1	100·0
STATEMENT "C"—			
Depreciation on Improvements and Plant	0 9 7	9	12·0
Interest on Land and Improvements	0 7 7	0 7	9·5
Interest on Floating Capital	0 5 3	0 4	5·7
Interest on Overdraft	0 0 5	0 1	1·4
Interest on Depreciation Charges	1 2 10	1 9	28·6
Balance of Expenditure	2 17 2	4 4	71·4
Totals	4 0 0	6 1	100·0

The preceding two Tables show the "Costs" of growing Pease at Turretfield over a period of six years to have been at the mean rate of £4 per acre and on a mean yield of 13¼bush. at the rate of 6s. 1d. per Bushel. These costs are considerably above current prices for Pease, namely, approximately 4s. 8d. on the farm. One item in these "costs" is unusually high relatively to Cereal Crops, namely, the "costs" of seed. It is not possible to avoid 2bush. seeding to the acre, and as the Bushel price frequently exceeds 6s., "costs of production" are rather heavily handicapped from the outset. Harvest operations, too, are always relatively costly because of high interest and depreciation charges on special types of harvesting machinery.

In past Reports I have compared the Pease-Wheat Rotation with the usual Bare Fallow-Wheat Rotation, and in 1928-29 I was able to show that whereas the Mean Profit on the Bare Fallow-Wheat Rotation had been at the rate of 2s. 2d. per acre, that of the Pease-Wheat Rotation had been at the rate of 18s. 1d. per acre—an advantage in favor of the latter rotation of 15s. 11d. per acre. At that time, however, I was able to base my results upon Wheat at 5s. a Bushel and Pease at 6s., instead of 2s. 5d. and 4s. 8d. respectively as at present.

All that can be said now is that at current prices both Rotations show Net Losses, namely, £2 7s. 4d. per acre for the Pease-Wheat Rotation and £2 12s. per acre for the Bare Fallow-Wheat Rotation, calculated upon "costs" recorded over the 1926-30 period. Hence, even in these difficult times, and on a basis of low yields for Pease, the Pease-Wheat Rotation would appear to show an advantage of 4s. 8d. an acre over the Bare Fallow-Wheat Rotation.

Finally, in Table XXXI. the Working Hours per acre absorbed by a Pea Crop and the succeeding Wheat Crop have been indicated:—

Table XXXI.

Summarising Working Hours per Acre for a Pea Crop and the succeeding Wheat Crop respectively.

	Field Pease.				Succeeding Wheat Crop.			
	Costs at 1s. 4·23d. per Hour.		Corresponding Hours.		Costs at 1s. 4·23d. per Hour.		Corresponding Hours.	
	s. d.	s. d.	Nos.	Nos.	s. d.	s. d.	Nos.	Nos.
1. Direct Labor—								
Preparation of Land ..	2 5		1·78		2 10		2·10	
Seeding Operations ...	3 4		2·48		2 6		1·82	
Spring Tillage	0 1		0·04		0 1		0·09	
Harvest Operations ...	4 4		3·21		3 9		2·78	
General Expenses	5 6		4·10		4 6		3·33	
		15 8		11·61		13 8		10·12
2. Indirect Labor		5 4		3·92		3 10		2·82
Total Labor		21 0		15·53		17 6		12·94
Corresponding number of 9½-hour days for 100 acres .			163 days				136 days	

Data in Table XXXI show that the Pease-Wheat Rotation offers greater scope for the profitable employment of Family Labor than the Bare-Fallow-Wheat Rotation. On the basis of 100 acres of Bare Fallow and 100 acres under Wheat, the Bare Fallow-Wheat Rotation should provide 181 days of Labor, corresponding to a Labor Income for the farmer and his family of £111 5s. for every 100 acres under Wheat, provided that receipts and expenditure balanced. On the basis of 100 acres of Pease and 100 acres of Wheat sown on Pea Stubbles, the Pease-Wheat Rotation should, on the other hand, provide for 299 days of Labor, corresponding to a Labor Income for the farmer and his family of £192 10s. for every 200 acres under crop, provided that receipts and expenditure balanced. Pease, moreover, present the advantage of a shorter growing period than Wheat, being sown later and harvested earlier than the latter, and it follows that from the standpoint of the distribution of Farm Labor over the year, they adapt themselves well to regular rotation with Wheat.

(*To be continued*).

HOW LONG DO SEEDS RETAIN THEIR GERMINATING POWER.

LONGEVITY EXPERIMENTS IN THE DEPARTMENT OF AGRICULTURE.

[By EDGAR W. PRITCHARD, Dip. Econ., Agricultural Botanist and Seed Analyst.]

The question of how long the various kinds of seeds will retain their germinating power is a very important one for the farmer and gardener, as well as for the seed merchant. For while the present germinating power of any given sample of seed can be quickly determined by a germination test, it is often useful to know how long any particular kind of seed can be kept with safety. This was apparently realised many years ago, but it was not until the modern scientific methods of seed testing were developed at the beginning of the twentieth century that longevity tests could be carried out with any degree of accuracy or convenience. Soon after regular seed testing stations were established, however, experiments were started in various parts of the world. It will be realised that such tests take time to give the full results, some seeds requiring 10 years to show any very considerable deterioration. This is probably the reason why very few reports have been published till quite recently. Now, however, more and more are beginning to appear, though most of them are progress reports rather than final results.

A longevity experiment on these lines was started in the Department of Agriculture in 1925, and though it is not yet complete for all the kinds of seeds tested, it seems desirable from the importance of the subject, that a progress report should be made available at once.

The seeds were all harvested in 1924; those from summer growing plants such as French beans and melons in March and April; and those from the winter growers, such as cabbage and green peas, in November and December; while the tests were made in the June and July of each year following. They were all taken from commercial grades of seeds, such as are usually found on the South Australian market, and not from specially selected samples.

The behavior of some of these samples, and also the reports of other experiments, seem to show that these results should not be taken as final for any particular kind of seed. For it has been found that different varieties of the same kind of seed, and even different samples of the same variety, vary to some extent, both in their germinating

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power when fresh, and their power of retaining their vitality when stored. A large number of tests with varying samples will evidently have to be carried out before any very definite standards can be set up. These results are, therefore, published more as a contribution to that end than as finally authoritative. In 1928 and 1930 no tests were made on account of pressure of other work.

Variety of Seed.	Germination per cent.					
	1925.	1926.	1927.	1929.	1931.	1932.
Beans, Broad, Windsor	98	99	97	96	91	90
" French Black Wax	100	90	87	90	89	91
" French Burpee's Stringless	96	90	—	91	88	84
" Canadian Wonder	100	96	96	91	90	85
Beet, Red, Long Blood Red	70	45·5	39	11	6·5	—
" Silver, Giant Lucullus	37·5	38·5	42·5	29	20·5	—
Cabbage, Springtide	94	82	64·5	39·5	7·5	1
" Enfield Market	76	32	22	3·5	0·5	0
" Succession	70	33	10·5	0	—	—
Carrot, Major	54·5	52	51·5	36·5	14·5	10
Cauliflower, Cooper's Giant	75	56	42	31·5	17	8
Celery, White Plume	52	—	51	54	0·5	0
Clover, Crimson	95	76·5	21·5	7	0	—
" Red	84	74·5	33	10·5	4·5	4
" Subterranean	82	86·5	88	74	68	57
" White	73	85·7	77	45·5	31	18·5
" Birdsfoot Trefoil	55	27	11	1	0·5	0·5
Cress, Curled	94	79·5	68	27·5	0	—
Cucumber, Long Green Prickly	98	51	48	41	30	14
Grass, Kentucky Blue	22	17·5	—	10·5	5	8·5
" Paspalum	43	39·5	36·5	39	20·5	19
" Perennial Rye	46	38	37	12	1·5	2
Lettuce, Market	97·5	96	68	3	0	—
Lucerne, Marlborough	92·5	88	76	61·5	45·5	34
Mangel, Long Red	58·5	45	54·5	21	9	—
Marrow, Long White Trailing	80	53	32	35	—	18
Onion, Brown Spanish	58·5	5	0	—	—	—
*Onion, White Lisbon	—	—	—	91	81	26
Parsnip, Cooper's Model	77·5	30·5	9·5	0	—	—
Peas, Greenfeast	97	94	98·5	96·5	98·5	90
" Sunrise	96	97·5	96	95	95	91
" Te Aroha	98	91	94·5	95·5	87·5	85
Pumpkin, Ironbark	74	59	56	56	35	31
Radish, Giant Crimson Forcing	97	82·5	89	82	84	69
Rape, Broad Leaf Essex	86·5	69	47	2	0	—
Rock Melon, Champion Market	100	100	100	99·5	95	98
Parsley, Moss Curled	92·5	62·5	57·5	0	0	—
Spinach, Large Leaf Prickly	31	26·5	3·5	3	—	2·5
Tares, Scotch	98·5	98·5	97	37	19	9
Tomato, Perfection	94·5	84·5	90	91·5	78·5	78
" Round Cluster Forcing	99	96·5	99	97·5	94	95
" Early Dwarf Red	98·5	97	97	96	94·5	97
Turnip, Golden Ball	99	97	97	61	25·5	27·5
" Model White	96	88·5	82	30	13·5	12
" White Nepaul	73	52·5	43	20	0·5	—
Watermelon, Ice Cream	81	59	51	52	16	16
FLOWER SEEDS.						
Antirrhinum	54	36·5	29	11	5·5	1·5
Aster, Comet	70	35	0·5	0	—	—
Cosmos	45·5	31	3·5	0	—	—
Mignonette	53	36	29·5	3	8	1
Stock, Ten Week	94·5	85·5	72·5	40	46	32
Wattle, Cootamundra	96	88	—	92	—	88

* 1927 crop.

SPRAYING EXPERIMENTS FOR CODLIN MOTH CONTROL—BLACKWOOD, 1931-32.

[By R. Fowler, Manager Blackwood Experimental Orchard.]

Codlin moth still remains one of the most serious pests of the apple and pear growers. Numerous spraying and other tests carried out in our own State, in the other States, and in all parts of the world where apples are grown commercially have long ago indicated the chief factors to be considered in its control. The introduction of summer oil sprays, new insecticides, the necessity for reducing the amount of objectionable spray residue combined with the fact that in certain seasons the percentage of codlin infested fruit still remains excessively high, seems to make continuous experimentation urgently necessary. The demand also still exists for more economical as well as more effective treatments, as in these times of low prices for our fruit, the costs of production must always be carefully studied.

When summer spraying oils were introduced some years ago comprehensive tests were carried out in the State Experimental Orchard and fully reported on in the *Journal of Agriculture* and in Bulletin 243. These experiments demonstrated beyond any doubt that the most effective control of codlin moth under our climatic conditions was to be obtained by spraying five times with a combination of oil and arsenate of lead, but that at the concentrations then recommended, the pecuniary gain through the increased effectiveness of the combined spray was not commensurate with the increased cost of the spraying material, and the added difficulty of removing the excessive amount of arsenical spray residue that chemical analysis revealed to be present on the fruit had also to be seriously considered at harvest time.

These facts naturally suggested the desirability of investigating the following points:—

1. The minimum concentration at which the combined oil-arsenate spray might be applied while still retaining its effectiveness.
2. If the omission of a cover spray during the time few moths are shown to be on the wing would reduce costs without impairing efficiency.
3. If by using the oil-lead-arsenate combination at the danger periods only, viz., the times of maximum emergence of moths of each brood, equally good results might be obtained.
4. If the effectiveness of the treatment could be maintained and the spray residue reduced by combining oil with Black Leaf 40 instead of arsenate of lead in the last cover spray.
5. If other proprietary lines could be used as substitutes for oil.

With the concurrence of the Chief Horticultural Instructor (Mr. Geo. Quinn), these points were therefore kept in mind when setting out the codlin moth spraying schedule for 1931-32. The schedule adopted is contained in the tables at the end of this article.

The season 1931-32 was the "on" or heavy cropping year of the varieties under test, viz., Cleopatra, Dunn's Seedling, Jonathon, Granny Smith, Esops, Spitzenberg, and Scarlet Nonpareil, all of which were carrying very heavy crops of fruit. The climatic conditions could hardly be classed as normal, as following a very wet winter the summer was abnormally dry—only 3.61 points of rain falling between October 1st and February 29th, and more than half of that fell during February. Some very hot spells were experienced in January, and the evening temperatures from October to February were mostly favorable for moth emergence. This did not, however, result in any excessive activity on the part of codlin moths. As previously noted and reported, the trapping records show that in the "on" year, fewer moths are generally caught in the traps, and there appears to be much less danger of heavy losses from codlin moths resulting, so that it would seem that the ordinary spray programme, without the addition of oil or increased quantities of arsenate, would be sufficiently effective in a heavy crop year. It should be borne in mind that the success of arsenate of lead sprays alone will depend on three primary factors—(1) the proper timing of the spray applications; (2) the thoroughness with which the work is carried out; and (3) the severity of the attack or number of moths to be combated. In the "off" year—such as this present season—it will probably be necessary to increase the strength of the arsenate and combine with it in two or three out of the five sprays ¾ per cent. to 1 per cent. of white oil.

SEQUENCE OF SPRAYINGS.

Calyx Spray.—With each succeeding year a greater number of growers are inclined to look upon this spray as more or less unnecessary and wasteful, and while prepared to admit that in a season like the present, when abnormally cool weather conditions prevailed right through October and the first moths were not noticed until November 7th—there may be some justification for the argument. It must be remembered, however, that in a normal season, numbers of moths have been caught by the 24th October, and to have omitted the calyx spray under those conditions would have meant taking a great risk of leaving what is considered the most vulnerable point of attack unprotected.

Although this spray may apparently be applied days before any moths appear, it clearly affords the only chance of filling the calyx cups with poison before the calyx lobes have closed, and thus is considered to help in controlling the spring brood larvae.

Spuler (1) says that this spray, in spite of many reports to the contrary, is of great importance, and should not be omitted, and quoted figures to prove his contention. In our own experiments, both this and in previous seasons, some decease of infested fruit has always been recorded from the trees receiving a thorough calyx spray.

Each test received five applications of spray with the exception of six trees in test A1 where the calyx spray was omitted, and in test G, where the third cover spray was not applied. The first and second cover sprays were timed to synchronise with the hatching of the first brood larvae and the maximum emergence of the first brood moths respectively, and the third cover spray was applied when the second brood moths were due to appear in greatest numbers. They were a week or so late this season.

The fourth cover spray was put out on the 16th February, though few moths were in evidence at this time. As it was expected that harvesting would commence on February 28th or 29th, and it was not deemed advisable to delay the spraying till later in the month and coat the fruit with arsenate of lead just before picking, thus increasing the necessity to wash or wipe the fruit before packing.

As in other seasons, every effort was made to ensure that the spraying was thoroughly well done. Friend type nozzles were used, attached to the pistol grips. A pressure of 175lbs. to 200lbs. was maintained, and each tree received upwards of 2galls. of spray at each application. This was sufficient to effectively cover every portion of the tree and fruit with spray.

Weather conditions at times of spraying were mostly favorable, with tempartures varying from 70° to 85°F. No rain closely followed any of the applications, and nothing was lost in this manner. The varieties of apples included in the tests have been previously mentioned.

In tabulating the results, the cropping and other data have been recorded from each tree in the test, and the number of trees has been limited to 12 or 14 to enable this to be done. Previous experience has shown that there is a wide variation of codlin infestation under the same conditions of treatment, and it would seem that the margin of error will be less if the final check up of percentages is computed from the actual crops taken from each and every tree in the test, rather than from two or more selected trees, or from a portion of the crop from each tree in the test. To illustrate this point individual tree records are given in Table I. covering tests A, B, C, and D.

DATA RELATIVE TO CODLIN MOTH SPRAYING TESTS, BLACKWOOD, 1931-32.

TABLE I.

Tests Carried Out in Block C: Cleopatra Apples: Twelve Trees in each Test.

Tree No.	Plot A.—Arsenate of Lead Powder 1lb. in 25galls., five times; 2nd, 3rd, 4th, 5th with spreader, ½lb. fluxit to 100gals.				Test B.—Lead Arsenate-Oil for first brood moths, and Nicotine Oil for second brood.				Test C.—Value of Clensel at peak Periods of first and second broods.				Test D.—Value of Increased Quantities of Lead Arsenate and Oil.			
	Total Crop per Tree in lbs.	Total Weight of Codlin Apples in lbs.	No. of Moths Trapped per Tree.	No. of Codlin Larvae caught in Band-ages per Tree.	Total Crop per Tree in lbs.	Total Weight of Codlin Apples in lbs.	No. of Moths Trapped per Tree.	No. of Codlin Larvae caught in Band-ages per Tree.	Total Crop per Tree in lbs.	Total Weight of Codlin Apples in lbs.	No. of Moths Trapped per Tree.	No. of Codlin Larvae caught in Band-ages per Tree.	Total Crop per Tree in lbs.	Total Weight of Codlin Apples in lbs.	No. of Moths Trapped per Tree.	No. of Codlin Larvae caught in Band-ages per Tree.
1	226	9½	21	8	394¾	8½	35	12	363½	37½	5	26	236	—	15	3
2	280¼	3¼	9	4	220¼	½	12	—	218½	9	11	8	162¼	¼	11	1
3	424¼	6¾	11	5	373¾	3¼	4	2	247½	2½	6	2	213¼	¼	4	2
4	269½	5¾	10	3	261½	1¼	14	—	217¼	2½	4	1	178¼	1	1	—
5	372¾	3	7	8	407¼	9¾	6	20	272	4	1	3	279	½	2	—
6	337¼	12½	4	8	190	1¾	5	1	257½	1¼	5	4	216	¾	1	1
7	380½	10	12	15	419½	8	5	11	337	17½	3	13	200	¼	2	3
8	297¼	7¼	7	11	381	10¾	7	8	347½	10¼	7	7	169	1½	5	1
9	282¼	5	10	7	111¼	½	5	2	250¼	8¾	2	7	224½	2	5	—
10	313½	9¼	6	11	379¾	9	5	16	320¼	12¾	5	16	186¾	4¼	5	—
11	226¼	13	9	5	255½	6½	7	13	287½	8¾	3	6	245¼	4¾	7	1
12	313¼	16¼	13	24	340½	14	11	12	263½	18	3	13	279¾	5¼	8	4
Total crop per Test of 12 trees	3,723¼	101½	119	109	3,735	74	116	97	3,382¼	132¼	55	106	2,590	21¼	66	16
Mean average per tree	310·29	8·46	—	—	311·25	6·17	—	—	281·85	11·06	—	—	215'83	1·77	—	—
Per cent. codlin per Test		2·73				1·98%				3·92%				·82%		
No. of codlin larvae per 100lbs. of fruit		—														

A study of this table will show wide variations in infestation under the same treatment. It also shows, that there does not appear to be any correlation between the number of moths caught in a test and the percentage of infested fruits recorded from that test.

Bandage traps were placed on all trees in the spraying tests, and these were carefully examined every 7 to 10 days and all grubs caught were counted and destroyed. Table II. shows the number from each test and the dates on which they were caught.

DATA RELATIVE TO TRAPPING CODLIN LARVAE IN BANDAGES, BLACKWOOD, 1932.

TABLE II.

Date Examined.	Test A.	A^1.	B.	B^1.	C.	D.	E.	F.	G.	H.	Test I.	Test J.	Total.
11/12/31 .	1	—	1	—	—	—	—	—	—	—	—	—	2
18/12/31 .	—	—	1	—	—	—	—	—	—	—	—	1	2
24/12/31 .	3	—	2	—	2	3	1	—	2	—	—	1	14
5/1/32 ...	7	1	7	—	4	1	1	—	4	1	—	1	27
13/1/32 ..	7	2	8	—	6	4	2	1	1	1	3	4	39
21/1/32 ..	10	4	8	1	8	—	8	1	5	—	1	3	49
29/1/32 ..	11	2	9	3	7	—	4	5	6	—	4	2	53
11/2/32 ..	11	5	6	4	18	2	7	4	6	2	7	7	79
19/2/32 ..	14	4	8	3	11	—	3	1	6	1	10	7	68
26/2/32 ..	13	8	9	—	11	—	2	1	10	2	7	5	68
4/3/32 ..	7	7	5	3	11	3	2	—	6	3	7	5	59
11/3/32 ..	6	3	11	1	7	1	3	—	9	—	8	6	55
19/3/32 ..	9	6	13	2	13	1	3	—	8	3	6	4	68
4/5/32 ...	10	7	9	—	8	1	1	2	13	9	14	5	79
Total .	109	49	97	17	106	16	37	15	76	22	67	51	662

Total grubs caught, 662.

It will be seen that very few grubs were caught till the end of December, and that from then onwards they were fairly well distributed throughout the season.

The harvest lasted until the 13th of April, when the last apples were picked in the tests, and the bandages were finally examined on the 4th May; the previous examination having been on the 19th March. In the interval most of the trees in the orchard had been stripped of fruit and all windfalls cleaned up so that the final catch would seem to indicate that there was not any indication that a large number of grubs were in evidence at the end of the season to start a heavy infestation in the following season. The total number of grubs caught throughout the season was 662 from 168 bandages, as against 690 in 1930-31 and 1,092 in 1929-30, the numbers getting progressively less.

In connection with bandage traps for catching codlin moth, a chemically treated corrugated cardboard bandage material is now procurable, and it is claimed that the grubs will enter this material freely, and they are then killed by fumes given off by the treated bandage. A supply of this material is on hand to be tested this season. At present—its price 25s. per 200ft.—is somewhat prohibitive, as 200ft. will only provide bandages for approximately 110 average sized trees. This material has been reported from America as being very effective, but that there is also some danger of injury to smooth barked trees from its use. These points will be reported on after experiments have been tried this season. If the labor attached to examining bandages can be eliminated and good results achieved with this material at a reasonable cost, it will mark a big step forward in codlin control, as without doubt the trapping and killing of grubs by means of bandages is of great assistance in keeping this pest within limits.

DATA RELATIVE TO CODLIN MOTH TRAPPING TESTS.

TABLE III.

Cleopatra Apples—12 Trees in each Test.						Eight Trees in each Test—2 each Cleopatras, Dunns, Jonathans, and Scarlets.						
Date Examined.	Test A.	Test B.	Test C.	Test D.	Total Catch from 48 Pot Traps.	Date Examined.	Test E.	Test F.	Test G.	Test H.	Total Catch from 32 Glass Jar Traps.	Total Catch from 80 Traps.
9/11/31 .	3	3	4	7	17	9/11/31	—	1	1	3	5	22
16/11/31 .	14	10	3	4	31	16/11/31	1	3	3	6	13	44
23/11/31 .	1	—	1	—	2	23/11/31	—	—	—	—	—	2
30/11/31 .	5	3	—	—	8	30/11/31	—	1	1	5	7	15
7/12/31 .	13	12	10	9	44	7/12/31	4	8	6	10	28	72
14/12/31 .	8	8	6	1	23	14/12/31	4	—	1	3	8	31
21/12/31 .	4	11	4	3	22	21/12/31	6	2	1	2	11	33
28/12/31 .	7	3	1	6	17	28/12/31	4	6	11	12	33	50
4/1/32 .	3	3	—	2	8	4/1/32	3	5	1	3	12	20
11/1/32 .	3	3	—	—	6	11/1/32	1	2	2	2	7	13
18/1/32 .	15	10	2	3	30	18/1/32	11	18	30	19	78	108
25/1/32 .	8	19	5	13	45	25/1/32	19	8	12	14	53	98
1/2/32 .	6	10	6	11	33	1/2/32	3	3	2	6	14	47
8/2/32 .	—	2	—	1	3	8/2/32	—	1	1	1	3	6
15/2/32 .	1	—	1	1	3	15/2/32	—	1	—	—	1	4
22/2/32 .	3	2	1	—	6	22/2/32	1	3	1	1	6	12
29/2/32 .	22	12	4	2	40	29/2/32	11	5	13	11	40	80
7/3/32 .	1	2	3	1	7	7/3/32	2	2	2	—	6	13
14/3/32 .	2	3	4	2	11	14/3/32	1	2	—	4	7	18
Totals ...	119	116	55	66	356		71	71	88	102	332	688

First moth caught November 7th. Total catch of moths, 688. Average per flower-pot trap, 7·42. Average per glass jar trap, 10·31.

Codlin Moth Trapping Records.

A few traps were placed in the pear block adjacent to the office about the 17th October, and in the main orchard tests on October 28th, the first moth being caught on November 7th. This is much later than usual, as in the previous season the first moths were most numerous between November 9th and 16th, and again between November 30th and December 7th, and the first brood moths were most numerous between January 18th and 30th, and the second between February 22nd and 29th. These times of emergence do not coincide with the previous season, and are difficult of explanation. Climatic conditions probably delay the emergence of the spring brood moths, causing the other broods to appear at later dates.

Tree with bandages attached. Upper bandage ordinary cornsack, lower bandage chemically treated to kill Codlin Larvae.

The total number of moths caught in 80 traps was only 688, as against 1,472 in 1930-31 and 1,266 in 1929-30 in 48 traps only. These figures indicate that the moth population in the orchard was again very light in the heavy crop year. Lack of humidity and a long, fairly hot summer in 1930-31 may account to some extent for large numbers of eggs proving infertile, or the sprays used were more effective in destroying them, as although 1,472 moths were trapped only 690 grubs were taken in the bandages, almost the same number as in the past season—622—when only 688 moths were caught. As we are now experiencing another dry summer, it will be interesting to note the effect on the incidence of codlin in this season's crop.

Tables III. and IV. shows the number of moths caught in each test, the time at which they were most prevalent, also the average weekly minimum and maximum shade temperatures and the highest shade temperature somewhere about sundown during the week, and the weekly rainfall. Temperature and humidity no doubt play an important part in the incubation and emergence periods of the codlin moth, and it can generally be assumed that knowing the approximate date at which a brood of moths is due to emerge, the occurrence of close, humid, and hot conditions for a few days will hasten the flight of moths, and that similarly, cold conditions will retard it. Accepting that there is some relationship between temperature, humidity, and the emergence of moths, these two factors appear to be more operative when, in their ordinary life cycle, moths are due to emerge, and cannot be accepted as a reliable guide as to when to expect a large emergence of codlin moths; therefore, the timing of sprays can only be satisfactorily done with the bait traps, and a thermometer placed in the orchard is not of great assistance in this regard except at the periods stated.

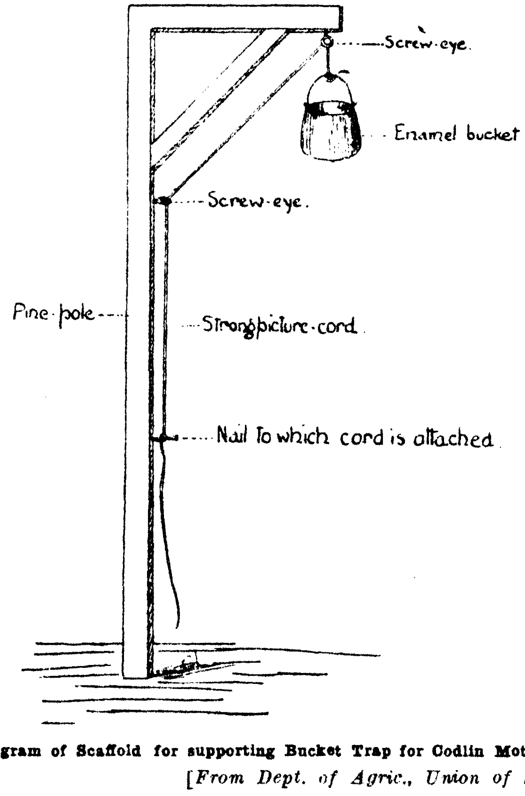

Diagram of Scaffold for supporting Bucket Trap for Codlin Moth.

[*From Dept. of Agric., Union of South Africa.*

In past seasons tests have been made with various lures, and from results obtained and other factors such as cost of materials, convenience of obtaining, and mixing, &c., it has been found that molasses with or without yeast is one of the most effective lures obtainable, used at a strength of 1 in 10 to 1 in 16, and this lure was used throughout the season at 1 in 10, and proved quite satisfactory. It is necessary to fill up the traps every week to replace the loss through evaporation, and every second week or so the whole liquid should be renewed.

and the arsenical residue only 0.005, which is below the export tolerance. It would seem, therefore, from these results that it is possible in the heavy crop year to control codlin with lead arsenate, and that by substituting an oil-nicotine spray for the last arsenate of lead, the affectiveness of the schedule is not impaired, but rather improved, and that at little extra cost and the arsenical residue is brought within the export tolerance. Though the result of one year's tests only, the figures throw some light on the fourth point of the investigation.

In plots D and H the combined oil-arsenate sprays were used three times, and the amount of arsenate was reduced from 4lbs. to 3lbs. per 100galls., and the oil from 1gall. in 80galls. to ¾gall. in 100galls. In the last cover spray, the oil-nicotine combination was used. This spray schedule considerably reduced the cost, but apparently without impairing efficiency, as the codlin marked fruit in Plot D was under 1 per cent., viz., 0.82 per cent., and in plot H 1.28 per cent., the arsenical residue being 0.039 and 0.036 respectively, rather above the export tolerance. These figures compare favorably with 0.61 and 1.58 in the same plots in the heavy crop year 1929-30, when the stronger mixtures were used; the arsenical residues are also reduced, the amounts in 1929-30 being 0.051 and 0.021.

Tree showing Bucket Trap in position, the trap being covered with wire netting to prevent birds removing moths.

Detailed results of 1931-32 *Spraying Tests for Codlin Moth—Blackwood.*

Test and Variety.	Spray Schedule.	Dates of Application of Sprays.	Total Crop per Test in Lbs.	Average Crop in Lbs. per Tree in Test.	Total Weight of Apples with Codlin Strings or Grub Marks.	Average Weight per Tree of Apples with Codlin Strings or Grub Marks.	No. of Codlin Larvae Caught in Bandages per 100lbs. of Fruit Gathered.	No. of Codlin Grubs Caught in Bandages per Test.	No. of Moths Trapped in Test.	Per Cent. of Codlin Moths Wastage per Test.	Grains of Arsenic As4O6, per Lb. of Apples.
A 12 Cleopatra...	Calyx spray—Arsenate of lead, 4lbs. powder per 100galls.; 1st, 2nd, 3rd, and 4th cover sprays, 4lbs. arsenate powder to 100galls., plus ½lb. calcium caseinate spreader per 100 gallons	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	3,723·5	310·29	101·5	8·46	—	109	119	2·73	0·0173
A1 12 Dunn's Seedling	Trees 1-6 Calyx spray—Arsenate of lead powder, 1-25; 2nd cover spray, arsenate of lead powder, plus fluxit; 1st, 3rd, 4th cover sprays, 2lbs. arsenate of lead per 100galls, with pysect 2ozs. to 16 gallons added; trees 7-12, Calyx spray omitted	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	1,646 1,545·75	274·34 257·62	88 51	6·34 9·5	— —	29 20	No traps —	2·31 3·29	0·0116
B 12 Cleopatra...	Calyx spray—Arsenate of lead, 4lbs. powder to 100galls.; 1st and 2nd cover sprays, arsenate of lead, 2-100 plus White Oil A ¾ per cent.; 3rd cover spray, arsenate of lead 4-100, plus spreader, ½lb.: 4th cover spray, White Oil A ¾ per cent., plus nicotine sulphate 1-1,600	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	3,735	311·25	74	6·17	—	97	116	1·98	0·0144
B1 12 Jonathans	Calyx spray—Arsenate of lead, 4lbs. powder per 100galls.; 1st, 2nd, and 4th cover spray, arsenate of lead 2-100, Proprietary preparation No. 1; ¾% 3rd cover spray, arsenate of lead, 4-100, plus ½lb. spreader	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	1,494·25	124·52	12·75	1·06	—	17	—	·85	0·0326
C 12 Cleopatra...	Calyx spray—Arsenate of lead, 4lbs per 100galls.; 1st, 2nd, and 4th cover sprays, arsenate of lead 2lb-100gall., Proprietary preparation No. 2; ¾% 3rd cover spray, arsenate of lead, 4-100, plus ½lb. spreader	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	3,382·25	281·85	132·75	11·06	—	106	55	3·92	0·01 5
D 12 Cleopatra...	Calyx spray—Arsenate of lead, 4lbs. per 100galls.; 1st, 2nd, and 3rd cover sprays, arsenate of lead, 3lbs.-100, plus 1 per cent. white oil A; 4th cover spray, white oil A, ¾ per cent, nicotine sulphate 1-1,600	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	2,590	215·83	21·25	1·77	—	16	66	·82	0·039

Detailed result of 1931-32 *Spraying Tests for Codlin Moth—Blackwood*—continued.

Test and Variety.	Spray Schedule.	Dates of Application of Sprays.	Total Crop per Test in Lbs.	Average Crop in Lbs. per Tree in Test.	Total Weight of Apples with Codlin Strings or Grub Marks.	Average Weight per Tree of Apples with Codlin Strings or Grub Marks.	No. of Codlin Larvae Caught in Bandages per 100lbs. of Fruit Gathered.	No. of Codlin Grubs Caught in Bandages per Test.	No. of Moths Trapped in Test.	Per Cent. of Codlin Moths Wastage per Test.	Grains of Arsenic As4O6, per Lb. of Apples.
E 2 Cleopatra 2 Dunn's Seedling 2 Jonathan 2 Scarlets	Calyx spray—Arsenate of lead, 4lbs. powder in 100galls.; 1st, 2nd, 3rd, and 4th cover spray, arsenate of lead, 4lbs. in 100galls., plus ¼lb. calcium caseinate spreader	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	2,326	290·75	64·25	8·03	—	37	71	2·76	0·0241
F 2 Cleopatra 2 Dunn's Seedling 2 Jonathan 2 Scarlets	Calyx spray—Arsenate of lead powder, 4lbs.-100; 1st and 2nd cover spray, arsenate of lead, 2-100, plus ¼lb. caseinate spreader; 4th cover spray, white oil B, ¾ per cent, and nicotine sulphate 1-1,600	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	2,608·5	326·06	13·75	1·72	—	15	71	·52	Not tested
G 2 Cleopatra 2 Dunn's Seedling 2 Jonathan 2 Scarlets	Calyx spray—Lead arsenate, 4lbs.-100 1st and 2nd cover spray, lead arsenate, 2-100, plus ¾ per cent. white oil B; 3rd cover spray omitted; 4th cover spray, white oil B, ¾ per cent., and nicotine sulphate 1-1,600	22/10/32 10/11/32 7/12/32 7/1/32 16/2/32	3,824·5	478·03	111	13·87	—	76	88	2·9	0·0049
H 2 Cleopatra 2 Dunn's Seedling 2 Jonathan 2 Scarlet	Calyx spray—Lead arsenate, 4lbs.-100; 1st, 2nd, and 3rd cover spray, 3lbs-100, plus 1 per cent. white oil B; 4th cover spray white oil B, 1 per cent, plus nicotine sulphate 1-1,600	22.10/32 10/11/32 7/12/32 7/1/32 16/2/32	2,947·5	368·44	37·75	4·72	—	22	103	1·28	0·0368
I 14 Cleopatra 7 Esopus Spitz 7 Jonathan 2 Granny Smith	Calyx spray—Lead arsenate, 4lbs. in 100; 1st, 2nd, and 3rd cover spray, lead arsenate, 4lbs. in 100; 4th cover spray, white oil C, ¾ per cent., plus nicotine sulphate 1-1,600	24/10/32 11/11/32 8/12/32 7/1/32 17/2/32	2,418·25 858 763·5 526·5	172·73 122·57 109·07 263·25	24·25 18 1 28	1·73 2·57 ·14 14·00	— — — —	17 11 3 2	— — — —	1·00 2·09 ·0018 5·31	0·0058
14 Cleopatra 8 Esopus Spitz 2 Jonathan 10 Granny Smith	Calyx spray—Lead arsenate, 4lbs to 100; 1st and 2nd cover spray lead arsenate, 2lbs.-100, plus white oil C, ¾ per cent.; 3rd cover spray, lead arsenate, 3-100, plus caseinate spreader; 4th cover spray, white oil C, ¾ per cent., plus nicotine sulphate 1-1,600	24/10/32 11/11/32 8/12/32 8/1/32 17/2/32	3,675·75 1,721·5 539·5 1,626·00	262·55 215·19 269·62 162·6	24 27·25 1·25 36·75	1·71 3·41 0·62 3·68	— — — —	20 27 3 1	— — — —	·65 1·58 ·023 2·25	0·0116

These figures seem to provide some information on point 1, and indicate that good results can be obtained at much less cost by reducing the amounts of oil and arsenate in the combination.

Tests B and G were practically the same except that in plot G the third cover spray with arsenate and spreader was omitted to gain some information on point 2. It would seem in this test that the costs had been reduced at the expense of effectiveness, as the codlin injury in test F was .52, and in test G 2.90, approximately 1.38 per cent. more where the spray was omitted. The margin of difference, however, is slight, and the increased amount of codlin injury is not more than that found between two or more trees receiving the same treatment. The point requires further testing. By omitting a third cover spray of arsenate of lead the spray residue was reduced from 0.14 in test B to 0.0049 in G, but as both are just on or below the export tolerance the fruit was not washed or wiped in either instance. If all costs were taken into consideration the net result would probably be in favor of test G. As no analysis for arsenical residue was made for test F, comparison is made with test B, which received the same arsenical sprays as F, and no doubt carried approximately the same amount of arsenious oxide.

Tests B and F, compared with tests A and E, throw some light on the third point of investigation, viz., whether the addition of white oils at the danger period of the first brood results in increased efficiency commensurate with the increased cost of materials. The codlin injury in tests B and F was 1.92 per cent. and .52 per cent. over 1.22 per cent., while in tests A and E codlin injury was 2.73 per cent. and 2.76 per cent. over 2.74 per cent., the assumed gain through the use of two oil-spray combinations being approximately 1.52 per cent., a result which does not seem to justify the increased

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costs. However, it should be pointed out that only 2lbs. of arsenate were used when combined with oil, as against 4lbs. when used alone, and this would reduce the comparative costs somewhat, and in addition, the arsenical residue was more pronounced.

Tests A and E showing an analysis on average of .098, as against .014 in B and F. The fruit in A and E would require careful wiping whilst in B and F it would pass without question. The fact that these tests were carried out in a year of light infestations of codlin must also be taken into consideration when assessing these results. These tests are being repeated again this season, when the codlin infestation is heavier and the crop lighter.

A further comparison might be made between plots A and E with approximate codlin injury 2.74 per cent., plots D and H average codlin injury 1.05, and Band F average codlin injury 1.25 per cent. These figures seem to indicate that a spray schedule made up of three cover sprays with additional arsenate and oil does not give much better result than the weaker strength of oil-arsenate 1.05 per cent. as against 1.25 per cent., and that a schedule made up of four lead arsenate sprays and one oil-nicotine is—in a year of heavy crop and light codlin infestation—almost as effective as either of the schedules where oil was used, 2.74 per cent. against 1.05 per cent. and 1.25 per cent. Again, these are only the results of one year, and must not be taken as conclusive.

Test J is a repetition of tests B and F, but with another brand of white oil, and the codlin injury, .65 per cent., seems to confirm statements previously made.

Point 5 referred to substitutes for oil, and two proprietary preparations were used in this connection in tests B1 and C. P.P. No. 1 gave very satisfactory results, codlin injury being only .85 per cent., but with P.P. No. 2 codlin injury was much higher, 5.92 per cent. As both these preparations cost as much as, if not more than, white oil, it is a matter for the grower whether the results justify their extensive use. From the point of view of controlling other pests such as woolly aphis or byobia mites, they are little more effective than white oils, at the low concentrations used, when applied as ovicides.

Three brands of white oils were used in the tests with slightly varied results: white oil A, 1.98 per cent. codlin, white oil B, .52 per cent., and white oil C, .65 per cent. No specifications are supplied with these oils to indicate their viscosity or unsulphonateable residue so that no comparison can be drawn of their respective values from this aspect. It has been found, however, that heavy, medium, and light oils vary considerably in their value as ovicides, and in America and elsewhere these points are carefully considered when selecting oils for spraying purposes, and it would appear necessary that similar information should be available in Australia, to enable growers to select oils most suitable for their purpose.

The question might be asked: "Are summer oils justified?" and it would seem, from the results obtained in our experiments, and from statements made by other research workers, that only in years of severe codlin infestation or in districts where codlin is specially hard to control can it be claimed that their extensive use is justified.

Many of the experiments discussed in this paper are being repeated again this season, and will be reported on at a later date, when probably more definite conclusions can be reached. The writer is indebted to officers of the Department of Chemistry for detailed analyses of arsenical residues and to Mr. A. L. Warden (Field Officer) for photographs.

(¹) Spuler, Anthony: Spraying Experiments for Codlin Moth Control, Washington Agricultural Experimental Station Bulletin No. 232.

(²) Pettey, F. W., Ph.D.: A Report of Further Experiments of New Methods for the Control of Codlin Moth in Western Districts of Cape Province.

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AUSTRALIA'S EXPORT TRADE WITH THE EAST.

In view of the very keen interest which has been taken in Eastern trade throughout Australia during the last two years, the Minister for Commerce (Hon. F. H. Stewart) has issued a statement showing trade statistics during the three years ended June 30, 1930, 1931, and 1932. Excluding the exports of bullion and specie to India and Ceylon, the value of merchandise exported was, during the three years mentioned, £14,059,833, £17,875,386, and £20,722,984, respectively. After taking the imports into consideration our trade with the East, recorded in Australian currency, resulted in a favorable balance of £12,179,942 during 1931-32, compared with a balance of £7,410,127 during 1930-31, and an unfavorable one of £1,668,938 during 1929-30.

Of the total value of exports during 1931-32 (£20,722,984), wool, wheat, and flour accounted for £16,949,695, and a comparison of these exports with the exports of other commodities is shown in the following table:—

TABLE.—*Showing Value of Export to the East of Wool, Wheat, and Flour in Comparison with Other Commodities.*

	1929-30.	1930-31.	1931-32.
Commodity—	£	£	£
Wool	4,512,341	6,528,817	7,590,930
Wheat	2,644,742	6,568,990	7,846,838
Flour	1,919,044	1,155,233	1,511,927
Total wool, wheat, and flour	9,076,127	14,253,040	16,949,695
All other commodities	4,983,706	3,622,346	3,773,289
Total value of exports of merchandise	14,059,833	17,875,386	20,722,984

Allowance must be made for the variations in the values of our currency which during 1929-30 were appreciably higher than during 1930-31 and 1931-32. It is apparent therefore that Australia's export trade with the East has shown a remarkable increase during the last two years. Such increase has been due almost entirely to the increase in the volume of the exports of wool, wheat, and flour, as a perusal of the following table will show:—

TABLE.—*Exports (in Quantities) of Wool, Wheat, Flour, and Other Commodities.*

	1929-30.	1930-31.	1931-32.
Commodity—	Lbs.	Lbs.	Lbs.
Wool, greasy and scoured	85,912,500	154,465,500	190,120,023
	Centals.	Centals.	Centals.
Wheat	6,359,980	31,708,191	31,371,850
Flour	3,484,605	3,248,752	4,587,671
Other Commodities—			
Butter	121,549	105,812	129,615
Frozen Mutton and Lamb	24,929	22,573	20,264
Frozen Beef	191,273	137,042	116,066
Bacon and Hams	11,417	10,761	11,973
Meat, Preserved in tins	4,219	4,146	5,898
Milk and Cream	146,726	114,925	130,405
Soap	42,137	25,874	25,305
Jams and Jellies	11,428	10,175	12,258
Canned Fruit	4,042	4,930	10,363
Dried Fruit	14,036	16,566	14,008
Fresh Fruit	51,606	60,758	63,924
Biscuits	14,364	8,435	6,526
Cheese	2,130	2,242	3,082
Confectionery	982	1,120	652
Total Other Commodities	640,838	525,359	550,339

(The table does not contain the figures for coal, tallow, leather, and sheep, which all show increases; nor sandalwood, fodders, horses, fruit juices, and syrup, in which decreases were recorded.)

The results of our trade in the products under the heading of "Other Commodities" are surprising, and particularly disappointing. Increased volume of trade has certainly been recorded in some of the products included in the table, but such increases are comparatively small.

The statement also gives in tabular form the quantities and values of various commodities exported to ports in the East during the period under review. The tables dealing with several items of export, together with comments on the trade are appended below.

DETAILS OF EXPORT TRADE.

WOOL.

Reference has already been made in a general way to the tremendous increase in the quantities of wool exported during 1931-32 compared with 1929-30. Exports during the three years were as follows:—

Wool—Greasy.

Country.	1929-30.		1930-31.		1931-32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	£
India.......	948,400	47,275	466,700	17,124	673,300	31,375
Japan	83,243,400	4,328,119	151,201,600	6,358,658	185,672,294	7,357,067
	84,191,800	4,375,394	151,668,300	£6,375,782	186,345,594	£7,388,442

Wool—Scoured.

	lbs.	£	lbs.	£	lbs.	£
Japan	1,333,800	106,627	2,337,700	120,141	3,016,300	156,693
India.......	354,600	27,017	459,500	24,715	549,300	33,267
China	2,000	208	—	2,436	67,579	4,106
Hong Kong..	30,300	3,095	—	5,743	139,687	8,358
Ceylon	—	—	—	—	1,563	64
	1,720,700	£136,947	2,797,200	£153,035	3,774,429	£202,488

The importance of Japan and the effects of the operations of her wool buyers on the wool markets of Australia may be gauged from the fact that her purchases of 185,672,294lbs. of greasy wool during 1931-32 represented approximately 25 per cent. of our total exports of wool, which amounted to 774,894,500lbs.; and in values £7,357,067 out of a total of £28,968,237. Her purchases of this commodity were only exceeded by those which were obtained for the United Kingdom, and which totalled 256,845,700lbs., valued at £10,117,217. Mainly as a result of her imports of wool and wheat from Australia, the year's trade between the two countries resulted in a balance of trade favorable to Australia to the extent of £9,262,393.

WHEAT.

The total quantities of wheat exported during 1931-32 did not vary to any marked extent when compared with quantities exported during the previous year. The total export showed a very small decrease, but values, on the other hand, revealed a very welcome increase.

Country.	1929–30.		1930–31.		1931–32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
China	—	—	14,639,816	3,037,595	18,189,928	4,395,595
Japan	1,686,685	702,913	10,775,964	2,201,301	12,878,291	3,383,868
India	4,665,947	1,937,543	6,118,143	1,288,543	181,711	33,440
Hong Kong	1,120	564	172,354	41,061	10,661	2,684
Ceylon	1,127	533	1,335	363	2,224	635
British Malaya	1,694	888	240	50	7,184	2,306
Philippine Islands	—	—	—	—	101,341	28,150
Netherlands East Indies	3,407	2,301	339	77	510	160
Totals	6,359,980	2,644,742	31,708,191	6,568,990	31,371,850	7,846,838

Both China and Japan bought very freely of Australian wheat, taking between them 31,068,219 centals out of a total export for the year of 76,523,666 centals. China's total made her the second largest buyer to the United Kingdom, to which country 19,799,793 centals, valued at £4,993,281, were exported. Japan was the third largest purchaser of our wheat during 1931-32. Export to India declined considerably. India has always been a buyer of our wheat, but the quantities taken by her have varied according to the yield obtained from her own wheat crops. One feature of this trade is the export of 101,341 centals to the Philippine Islands. Shipments of wheat to the Philippines from Australia had not previously been made for a considerable period.

FLOUR.

Flour exports during 1931-32 show an appreciable increase when compared with the previous year. It will be noted that exports to all countries with the exception of Ceylon and India showed increases during 1931-32; the outstanding feature, however, is the trade with Hong Kong.

Exports during the last three years were as follows:—

Country.	1929–30.		1930–31.		1931–32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
Netherlands East Indies	1,651,900	924,620	1,495,309	534,691	1,711,391	529,294
British Malaya	1,023,193	556,317	836,824	302,053	873,285	277,781
Ceylon	425,027	222,343	432,606	139,886	388,832	127,137
Philippine Islands	174,137	102,408	178,974	76,905	235,248	95,488
Siam	127,210	68,194	128,162	44,521	135,013	39,077
Hong Kong	58,664	31,439	118,934	40,174	1,071,141	382,168
Japan	15,606	8,776	14,885	5,334	32,997	11,026
India	4,164	2,340	2,646	966	2,577	749
China	4,704	2,607	40,412	10,703	137,187	49,207
Totals	3,484,605	1,919,044	3,248,752	1,155,233	4,587,671	1,511,927

The 1,711,391 centals taken by the Netherlands East Indies during 1931-32 were in excess of the quantities taken by her during the two previous years. The quantities taken by British Malaya were an increase on the quantities taken during 1930-31, but still short of the exports to that country during 1929-30. Exports to the Philippine Islands increased, while Siam also increased her purchases. China, together with Hong Kong, considerably increased her purchases, and Japan also purchased increased quantities.

BUTTER.

Exports of butter, more particularly tinned butter, have always contributed largely to the total value of our export trade to the East. Exports during 1931-32 showed an appreciable increase both in volume and value when compared with the previous year. The outstanding feature of the table is the increase in exports to the Netherlands East Indies. Other features of interest are the increased quantities sent to China and the decrease in the trade in this commodity with Japan.

Exports during the three years were as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
Netherlands East Indies	70,154	476,899	63,908	374,862	80,928	418,976
British Malaya ..	17,261	119,132	11,048	59,701	13,985	74.436
Philippine Islands.	9.428	66,814	10,582	61.024	8.951	49,765
China	8,299	58,646	7,882	41.028	12,660	65,349
Hong Kong	8,384	58,993	6,334	37,644	6.175	33,552
Ceylon	3,792	25,002	3,558	19,603	4.186	22.276
India	394	3,057	613	3,758	682	3,990
Japan	2,781	17,356	835	4,877	438	2,410
Siam	1,056	7,663	1,052	5,862	1,610	9.037
Totals	121,549	833,562	105,812	608,359	129,615	679,791

The table reveals a marked fluctuation in the quantities exported from year to year to British Malaya, and a decline in the quantities sent to the Philippine Islands and Hong Kong. Increasing quantities were, however, recorded in the exports to Ceylon, India, and Siam.

FROZEN MUTTON AND LAMB.

Exports of this commodity during the last three years were as shown hereunder:—

Country.	1929-30.		1930-31.		1931-32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
British Malaya ..	13,495	32,118	10.226	23,504	9.735	19,649
Hong Kong	3,495	8.390	3.511	6.576	3,974	7.106
Ceylon	5,491	13.394	5,817	11,832	3.949	7,846
Philippine Islands.	1.719	4.487	1,901	4,110	1.842	3.714
Japan	590	1,232	542	936	660	1.107
Netherlands East Indies	139	271	Not available	—	86	164
India	Nil	Nil	576	1,727	18	36
Totals.......	24,929	59,892	22.573	48,685	20.264	39,622

The figures reveal a steady decrease during the period, a decrease due principally to the decline in the trade with British Malaya and Ceylon. It is interesting to note, however, that exports of live sheep to British Malaya during 1931-32 showed a substantial increase, the number exported being shown as 46,825, as against 25,758 during 1930-31 and 33,205 during 1929-30. The small decrease in the quantities of frozen mutton and lamb would, therefore, appear to be more than compensated by the increased trade in live animals. The trade with the remaining countries with the exception of a slight increase in the case of Hong Kong, and a decline in the trade with India, remained relatively stable.

FROZEN BEEF.

A perusal of the table of exports of frozen beef discloses a further decline in the quantities exported during 1931-32, in addition to the very decided falling off in this trade during 1930-31. The details of the exports are shown hereunder:—

Country.	1929-30.		1930-31.		1930-32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
Philippine Islands.	73,854	134,658	62,635	113,297	31,800	47,205
Japan	62,219	95,423	32,756	45,487	39,108	42,639
British Malaya ..	27,573	53,304	23,166	47,536	18,810	36,424
Hong Kong	11,923	24,712	7,009	12,522	12,177	19,237
Ceylon	6,283	13,992	4,515	10,725	5,930	12,027
Netherlands East Indies	5,283	8,632	2,668	3,880	1,096	1,580
China	4,124	9,533	4,293	7,434	7,132	9,806
India	14	54	Not available		13	47
Siam	—	—	Not available		Not available	
Totals	191,273	340,308	137,042	240,881	116,066	168,965

The principal decline in the trade has been with the Philippine Islands. This decrease was due to the loss of the contracts for the supply of beef held by Australian exporters for a number of years, but which it is understood have been again obtained for Australia during the present year. The trade with Japan has always been subject to fluctuations, but the increase this year still leaves a big leeway to be made up before exports reach the 1929-30 figure. There has been a decided decline in the trade with British Malaya; reference to the increasing numbers of live sheep imported into this country has already been made, and it has been stated that this importation of live stock has influenced the quantities of frozen meats imported. Exports to both China and Hong Kong show an increase when compared with previous years, but those to the Netherlands East Indies have declined to an almost negligible quantity.

BACON AND HAMS.

Notwithstanding severe competition from Continental countries, Australian exporters are gradually increasing their trade in bacon and hams. This is revealed by a perusal of the exports during the three years under review:—

Country.	1929-30.		1930-31.		1931-32.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Centals.	£	Centals.	£	Centals.	£
Netherlands East Indies	4,937	42,396	4,966	34,711	5,385	36,195
British Malaya ..	3,290	25,756	2,638	16,515	2,533	15,311
Philippine Islands.	1,870	15,182	1,801	11,902	2,009	12,240
Hong Kong	625	5,296	582	4,082	782	5,023
India	616	4,949	523	3,517	241	1,608
Ceylon	52	357	145	768	109	633
China	27	246	33	193	849	3,210
Japan	—	—	5	31	5	28
Siam	—	—	68	524	60	366
Totals	11,417	94,182	10,761	72,243	11,973	74,614

Exports to the Netherlands East Indies again showed an appreciable increase. Exports to British Malaya on the other hand declined, but such decline was only very slight. Exports to the other countries, with the exception of China, remained relatively stable; decreases in the trade with India and Ceylon being offset by increases in the trade with the Philippine Islands and Hong Kong. China, however, increased her purchases considerably.

MEAT—PRESERVED IN TINS.

Although our exports of meat (preserved in tins) are relatively unimportant, it is interesting to note that the quantities sent to the East during 1931-32 were in excess of the recorded exports during the two previous years. Details of the exports are as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
India.............	1,536	6,192	1,838	7,828	1,924	6,923
Netherlands East Indies	990	3,572	876	2,830	1,696	4,810
Hong Kong	357	1,186	480	1,534	1,089	3,499
British Malaya ...	547	3,671	293	2,419	170	781
Ceylon	705	2,104	421	1,781	505	1,724
Philippine Islands.	22	111	50	210	157	565
Japan	62	334	3	11	228	692
China	—	—	185	911	129	444
Totals	4,219	17,170	4,146	17,524	5,898	19,438

With the exception of British Malaya and China, increasing quantities were recorded as having been exported to all countries. The most noticeable increases were to the Netherlands East Indies and to Hong Kong, the exports during 1931-32 being approximately double the quantities exported during the previous years.

SHEEP.

The growing importance of this trade and its effects upon exports of frozen meat to British Malaya have already been commented upon. Details of exports during the past three years were as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Number.	Value.	Number.	Value.	Number.	Value.
		£		£		£
British Malaya ..	33,205	22,915	25,758	10,886	46,825	13,709
Japan	696	7,050	—	—	230	1,322
India............	—	—	7	45	106	44
Netherlands East Indies	—	—	60	24	—	—
Totals	33,901	29,965	25,825	10,955	47,161	15,075

HORSES.

A very valuable trade in the export of horses to the East has been developed by Australian exporters, although it is noted that the numbers exported have shown a gradual decline during the last three years. The figures for all countries were as follows:—

Country.	1929–30.		1930–31.		1931–32.	
	Number.	Value.	Number.	Value.	Number.	Value.
		£		£		£
India	5,662	108,402	4,582	80,362	4,462	79,717
British Malaya	45	4,370	80	6,450	123	7,432
Japan	20	2,685	15	1,850	20	1,786
Netherlands East Indies	314	7,320	165	8,920	28	1,573
Philippine Islands	5	195	—	—	12	720
Siam	45	1,785	108	3,375	49	980
Ceylon	—	—	4	600	—	—
Hong Kong	—	—	20	300	54	651
China	—	—	—	—	5	150
Totals	6,091	124,757	4,974	101,857	4,753	93,009

India is by far the most important market in the East, and exports did not decline to any appreciable extent during 1931-32 when compared with the figures for 1930-31, although there is a decided decrease when compared with the 1929-30 figures. The trade with the Netherlands East Indies also revealed a considerable decline from 165 horses valued at £8,920 during 1930-31, to 28 horses valued at £1,573 during 1931-32.

JAMS AND JELLIES.

It is pleasing to note that the figures for 1931-32 reveal a welcome increase in the volume of this trade, although these figures are still much below the recorded exports during 1929-29, when 15,559 centals valued at £46,551 were exported to the East. Figures for the last three years were as follows:—

Country.	1929–30.		1930–31.		1931–32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
India	4,956	14,477	4,165	12,037	4,735	13,349
Hong Kong	1,592	4,409	1,505	4,069	2,290	6,144
China	1,201	3,519	1,108	3,196	1,201	3,329
Ceylon	843	2,764	841	2,370	1,425	3,807
Netherlands East Indies	1,189	3,653	1,055	3,279	1,077	3,089
British Malaya	816	2,436	766	2,219	859	2,295
Philippine Islands	831	2,335	689	2,007	614	1,487
Japan	—	—	4	10	43	94
Siam	—	—	42	109	14	43
Totals	11,428	33,593	10,175	29,296	12,258	33,637

Our principal market for jams and jellies in the East is India, the 4,735 centals exported to that country during 1931-32 being an increase on the 4,165 centals shipped during 1931-32. Increased quantities were sent to practically all countries—Hong Kong, China, Ceylon, British Malaya, and the Netherlands East Indies.

CANNED FRUITS.

In a previous statement reference was made to the growth of the trade in canned fruits when it was mentioned that a further marked improvement in the volume of this trade would be manifest in the immediate future. Although conditions in the industry were far from being normal during the season, it is pleasing to record that exports during 1931-32 showed an improvement of more than 100 per cent. Details of the exports are set out hereunder:—

Country.	1929-30.		1930-31.		1931-32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
India............	3,376	7,460	3,494	6,731	4,498	9,128
Netherlands East Indies	264	638	430	884	2,128	3,635
Hong Kong	39	81	252	444	1,549	2,556
Japan	62	138	244	389	381	654
British Malaya ...	99	249	172	373	831	1,782
China	62	103	211	358	736	1,313
Ceylon	140	276	127	228	240	476
Totals	4,042	8,945	4,930	9,407	10,363	19,544

All countries took increased quantities of canned fruits, the biggest increases being recorded in the trade with the Netherlands East Indies and Hong Kong. From information available within the department, it would appear that the Australian fruit canning interests have availed themselves of a favorable opportunity to exploit the markets of the East, and it is confidently anticipated that exports of this commodity during 1932-33 will exceed the total export of 10,363 centals during last year.

FRUIT JUICES AND SYRUPS.

A further decline in the quantities of fruit juices and syrups exported was recorded during 1931-32, the exports being as follows:—

Country.	1929-30.		1930-31.		1931-31.	
	Gallons.	Value.	Gallons.	Value.	Gallons.	Value.
Netherlands East Indies	59,356	22,976	54,822	21,088	42,661	16,280
India............	6,299	2,608	5,431	2,165	4,117	1,602
British Malaya ...	1,648	712	1,890	757	3,992	1,408
Hong Kong	1,073	541	1,731	672	1,425	566
China	1,844	854	1,315	647	1,818	1,798
Philippine Islands.	1,436	595	1,620	688	1,540	675
Japan	84	31	274	123	241	72
Ceylon	388	191	353	147	1,030	290
Totals	72,128	28,508	67,436	26,287	56,824	22,691

The decline in trade is due to the decreased quantities taken by the Netherlands East Indies, whose imports from Australia were shown at 42,661galls., compared with 54,822galls. during the previous year. A decline in the trade with India was offset to a certain extent by the increases recorded in the exports to British Malaya, China, and Ceylon.

DRIED FRUITS.

The volume of the trade in dried fruits during 1931-32 showed a decrease when compared with the previous year, but was still very much greater than the trade during 1928-29. Details of the trade with the various countries are shown as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
Ceylon	4,826	10,034	4,332	8,488	2,943	6,388
Netherlands East Indies	4,286	7,883	5,389	8,779	4,107	7,569
Hong Kong	1,964	3,564	3,100	5,088	4,623	7,583
China	1,606	2,986	1,546	3,162	482	953
British Malaya ...	885	1,451	1,084	1,888	839	1,689
India............	469	1,091	1,115	1,855	1,014	2,275
Totals	14,036	27,009	16,566	29,260	14,008	26,457

The cause of the decline was the falling-off in the trade with Ceylon, the Netherlands East Indies, and China. These decreases were offset to a certain by an increase in the trade with Hong Kong, a trade which has shown a decided improvement.

FRESH FRUITS.

Exports of fresh fruits again revealed an appreciable increase, the figures for the three years being as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
British Malaya ...	18,808	26,944	18,111	26,863	16,424	22,251
Netherlands East Indies	15,848	23,230	23,873	22,744	22,353	29,905
Ceylon	15,377	24,841	13,656	21,391	12,446	17,615
India............	362	608	457	906	2,116	3,429
Hong Kong	861	1,519	3,109	3,985	6,790	9,171
Philippine Islands.	350	437	—	—	16	31
Japan	—	—	124	149	806	746
China	—	—	1,428	1,608	2,973	3,841
Totals	51,606	77,579	60,758	77,646	63,924	86,989

A feature of this table is the small decrease in the volume of what might be termed the ''established'' trade with British Malaya, the Netherlands East Indies, and Ceylon, a decrease which was more than offset by the increased trade with Hong Kong, India, and China. The trade with Hong Kong and China has only been developed in recent years, and the progress which has been made is indeed gratifying. Exports to Hong Kong which during 1929-30 amounted to 861 centals valued at £1,519, increased to 6,790 centals valued at £9,171 during 1931-32, while exports to China, which were negligible prior to 1930-31, were recorded at 2,973 centals valued at £3,841 during last year. Satisfactory progress would also appear to have been made in the markets of India and Japan.

CHEESE.

Although the trade in this commodity is relatively small the trade during the last three years has shown a small but steady growth with a total of 3,082 centals valued at £13,801 exported during 1931-32. Exports to the various countries were as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
Ceylon	334	1,795	337	1,479	279	1,147
Hong Kong	169	841	161	790	357	1,843
India	246	2,221	201	1,750	256	1,932
British Malaya ..	1,265	6,124	1,369	5,306	1,350	5,294
Netherlands East Indies	49	480	41	376	38	332
Philippine Islands.	67	702	73	638	129	806
China	—	—	53	327	651	2,272
Japan	—	—	7	34	22	175
Totals	2,130	12,163	2,242	10,700	3,082	13,801

Increased exports during last year were sent to China and Hong Kong, the increase from 53 centals during 1930-31 to 651 centals during 1931-32 in the case of China largely accounting for the increased volume of the total trade.

FODDERS.

From the table shown hereunder it will be noted that the trade in fodders has been subject to many variations. The total exports during 1929-30 amounted to 62,205cwts., which declined to 37,443cwts. the following year, but reached 55,143cwts. during 1931-32. Exports were as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Cwts.	Value.	Cwts.	Value.	Cwts.	Value.
		£		£		£
Ceylon	9,138	2,809	6,220	1,976	5,488	1,395
Hong Kong	3,425	1,160	2,144	697	4,578	1,531
India	22,696	6,996	2,972	1,197	8,083	2,072
British Malaya ..	18,485	6,200	20,799	5,421	26,877	6,830
Netherlands East Indies	2,041	728	2,169	622	2,471	646
Philippine Islands.	6,420	2,123	3,139	860	5,293	1,197
China	Not available		Not available		1,034	245
Japan	—	—	—	—	1,319	193
Totals	62,205	20,016	37,443	10,773	55,143	14,109

Quantities exported to India showed an increased during 1931-32 when compared with the previous year, but are much below the figures for 1929-30, when 22,696cwts. were exported. The trade with British Malaya, however, has shown a continuous expansion from 18,485cwts. during 1929-30 to 26,877cwts. during last year. In the case of all other countries, with the exception of Ceylon, increased quantities were exported during 1931-32 when compared with the previous year.

Milk and Cream—Dried, Powdered, Preserved, Condensed, and Concentrated.

It will be noted that while the total exports of this commodity during 1931-32 have shown an increase when compared with exports during the previous year, the trade with the various countries was subject to pronounced fluctuations. Details of the trade were as follows:—

Country.	1929-30.		1930-31.		1931-32.	
	Centals.	Value.	Centals.	Value.	Centals.	Value.
		£		£		£
British Malaya ..	63,896	344,028	38,646	145,330	72,218	260,280
Netherlands East Indies	64,383	336,408	54,367	197,753	28,916	103,973
China	7,585	99,538	7,509	87,455	8,401	88,084
Japan	4,616	62,027	4,382	51,639	1,552	18,028
Siam	87	1,182	138	1,664	1,127	4,084
Ceylon	2,044	26,095	1,502	16,285	2,006	17,013
Hong Kong	2,199	26,973	2,305	26,216	943	8,870
India	1,301	16,436	5,321	32,087	11,449	50,332
Philippine Islands.	615	7,987	755	8,651	3,793	16,433
Totals	146,726	920,674	114,925	567,080	130,405	567,097

It is rather difficult to ascertain a satisfactory explanation as to the reason for these variations in trade. In the previous report reference was made to the decline in the exports of this commodity to British Malaya, and mention was made of the export of 158,865 centals of milk and cream to that country during 1927-28. It will be noted that there has been a very substantial increase in the trade during 1931-32, when 72,218 centals were imported from Australia, compared with the 38,646 centals which were obtained from this country during 1930-31. Exports to the Netherlands East Indies have declined considerably from 64,383 centals during 1929-30 to 28,916 centals during the past year. It would appear from the figures available that exports of this commodity from Australia depend to a very large extent upon the activities of an organisation interested in this trade and having world wide interests.

In his concluding remarks on trade relations in general the Minister states that during the past two years numerous firms have given the selling rights of their goods in Eastern markets to persons who are entirely ignorant of the East and of the conditions existing in the markets, and in many ways were not qualified nor equipped for the task which they set out to accomplish. Their efforts to push the sale of these goods on what might be termed their ''flying'' visits to the East were not always successful. The Department has endeavored to dissuade such persons from making these visits, as it is realised that, not only are the prospects of success in their venture very remote, but it is quite possible that incalculable harm can be caused by them with resultant detrimental effects on Australian trade generally.

Pending the settlement of the question of official representation throughout the East, it is suggested that caution should be exercised by manufacturers and exporters in the choice of the agents in the East, and that wherever possible such agencies be given to reputable persons and firms already established there, or to persons in Australia who have the necessary finance to enable them to become permanently established in one of the principal markets of the East.

GENERAL FARMING PRACTICES ON UPPER EYRE'S PENINSULA.

[By W. H. BROWNRIGG, H.D.A., District Agricultural Instructor.]

Passing through a term of inflated prices for produce, making money always available, has caused farmers to feel the slump in values much more than our thrifty forefathers would have done. Unrestricted spending became the rule rather than the exception, and can be attributed to the ease with which money was earned, and when this was overdone, the almost universal credit that was so easily obtained. The most vital point that confronts the producers to-day is to make ends meet, to economise in order to face the present economic situation.

The first step is to see what can be done to produce more or better quality at a lower cost than has been the case in the past. Statisticians and economists have gone extensively into the cost of production of certain primary products, and have found in the case of wheat that it can be produced at a far lower cost per bushel when worked in conjunction with sheep. The minute details gone into when arriving at costs may be somewhat intricate and possibly hard to understand by the average farmer. The farmer is allowed a fair wage or salary for his work, and costs are charged for every turn of a wheel. Wheat under local conditions—taking into consideration the price of land with its productive power under average conditions of rainfall and its cheapness of working—can be produced as cheaply, if not more cheaply, than in any other district in South Australia. It is necessary, therefore, to consider the problem from a mixed farming point of view.

CROP ROTATIONS.

The cheapest method of producing wheat in dry areas is by using correctly-worked fallow to precede the crop. Many farmers have peculiar ideas of what a fallow should be and the art of producing the correct result. Some farmers work their light land too much, with the wrong type of implement, and others allow the land to lie after ploughing, a prey to weeds and evaporating elements. With light textured soil it is not good practice to fallow the same land more than once in four years, and the constant cropping of this class of country has been most detrimental in the mallee areas of New South Wales, Victoria, Western Australia, and this State. The turning up and working of land to be acted on by the atmosphere has a tendency—when repeated too much—to turn out a great deal of humus, alter its texture, and aggravate the menace of drift.

The practice of fallowing and rotation is by no means new, as the principles were used in the time of Virgil and Cato. In those days agricultural areas were divided into three sections, one-third to be cropped, one-third grazed, and one-third fallowed by the law of the land. To safeguard mallee farmers, these laws, amended to suit local conditions, would be very beneficial and undoubtedly bring good results. In the Wimmera district of Victoria, which contains some of the most suitable land for wheat-growing in Australia, it is found that over a period of six years:—1. Wheat grown continuously yielded an average of 11.17bush. per acre. 2. Wheat after bare fallow yielded 34.03bush. per acre. 3. Wheat, pasture, bare fallow, yielded 35.52bush. per acre. 4. Wheat, oats, bare fallow yielded 38.05bush. per acre. 5. Wheat, oats, pasture, bare fallow yielded 37.08bush. per acre. The latter principle, or No. 5, is the most suitable for local conditions, and it shows roughly three times the produce per acre than wheat continuously grown. I have often stated that it is not the largest area put in cheaply that gives the greatest net return, and farmers who sow smaller areas under better conditions will undoubtedly come out best in the end. The difference between the production on unfallowed land and fallow in this State, where fallow is most essential, is over 7bush. per acre.

FALLOWING.

The aim of fallowing is to have an area of land at seeding time in such a condition that it is free from weeds, has only a shallow mulch overlying well compacted underlayers, and is well provided with available plant food. In this portion of the Peninsula, if these conditions are not attained, maximum wheat crops cannot be grown. Weeds in wheat, besides helping to drain the land of moisture and plant food, compete with the wheat crop to the detriment of it. Solid underlayers are essential, because the wheat plant demands conditions which necessitate its forcing its roots between firmly compacted particles of soil. When the plant's roots come in contact with open spaces, that portion dies and gives the plant such a check that it may only partially recover. The mineral constituents essential to the plant are usually present in sufficient quantities in our soils to last hundreds of years, and being in insoluble combinations, they become available very slowly, but the exposure of the soil's particles to the weathering agents during the process of fallowing, tends to liberate these plant foods and make them available for the plant's use.

Under local conditions, the land should be ploughed early—say June-July—at any rate before the heavy falls of the rainy season have finished, because there is no better soil packer than rain, and the washing down of the soil particles simplifies subsequent cultivation.

The object in view is consolidation of the under layers, and as the soil is naturally well aerated and has a tendency to be open in texture, shallow ploughing is advocated, and cultivations should only take place when necessary, and then at a very shallow depth. The condition of the soil is made encouraging to the germination and growth of weeds in order that they can be destroyed. In the destruction of weeds commonsense should be used, farmers always remembering that small weeds are much easier to destroy than those that have made considerable growth. If weeds are allowed to get away, the cultivation necessary to destroy them would have to be deep and defeat the object of fallowing.

Spring-tine machinery has not proved good in local soils, where the texture is light and where stumps are present. The set of this type of machinery is continually becoming altered, not drawing evenly, and doing a great deal of harm to the fallow. Trip-tine combines, bridle-draft cultivators, and disc seeddrills have proved the best implements with which to lightly work the land and do the seeding. The time for seeding depends on the season to a great extent, but generally speaking, crops sown before the end of June have given best results, as has been shown by Crop Competitions.

The choice of varieties is limited to fast growing, early ripening wheats of the Gluyas type, and very good results have followed the sowing of Nabawa, Sultan, Early Gluyas, Improved Gluyas, Felix, Canberra, Merridin, and King's White.

CONTROL OF DISEASE.

Disease control is one of the phases of farming that more serious application could be given to by the average farmer. Such diseases as take-all, bunt, and flag smut take a very heavy toll each year, and in a measure are preventable. The best method of controlling take-all is rotation cropping, especially with oats, and providing the wheat crop with such conditions that it gets a really good start and continues in good, healthy, and sustained growth. This growth depends on the soil being in a good mechanical condition at seeding time, and the ideal conditions may be described as soil ploughed up and subsequently worked down so that only about 2in. at the surface are loose, and the soil immediately underneath is firmly compacted together. All stubbles affected with this disease should be burned and oats sown following the wheat crop.

Bunt, or stinking smut, is a disease being fairly well controlled by farmers who insist on clean seed wheat. Seed containing smut balls cannot reasonably be termed seed wheat, but all seed should be treated either by using (*a*) wet pickle, preferably ¼ per cent. formalin, or (*b*) dry copper carbonate. The former method should be used if there be any visible smut, whilst the latter is used as a spore killer and to keep wheat free from bunt. This latter method can be used at any time during the slack part of the year, whilst when formalin is used it is better sown in a moist condition. Flag smut is a disease which has been the cause of great losses during recent years, and is controlled in a similar way to take-all, and by the use of resistant varieties such as Nabawa or Ford.

SEED AND FERTILIZER.

The quantity of seed per acre varies with the state of cleanliness of the field; where weeds are anticipated, more seed is used than on clean paddocks, but quantities from 50lbs. to 70lbs. per acre are recommended. Of latter years, farmers have fully realised the benefit to be derived from using graded seed, because the germinating power of large seeds is greater than that of small seeds of the same variety and same harvest. Under similar conditions, large seeds always give higher yields of more evenly large and superior grain, and the weight per bushel of grain produced from large seed is greater than that from small seed. At probably no far distant date, with the amount of wheat being produced in the world, wheat will have to be put on the market in a better condition than it is to-day, and may be sold in grades and under brand, as is the case with wool.

The manuring of wheat—fortunately in South Australia—is the making good of only one deficient mineral plant food, namely, phosphoric acid. Experiments have proved that under existing conditions there is very little, if any, necessity, if fallowing is practised, for applying nitrogeneous fertilisers, and it appears that there is sufficient potash in our soils. The only manure necessary at present is superphosphate, which is applied in quantities of from 45lbs. of 45 per cent. to 112lbs. of the same grade per acre.

SHEEP ON THE FARM.

Sheep have proved themselves if not essential, very nearly so, for the best returns from wheat. These sheep, however, should be the right type for the district and judiciously handled. When treated in this manner they mean a direct as well as indirect profit for the owner. At present Merinos hold pride of place, and farmers not already in possession of the suitable type, which may be described as large-framed, roomy, plain-bodied sheep, well covered with medium type wool, should obtain "classed for age" ewes from some station. These sheep are quite suitable for farmers to start a flock from, as the sheep would not be culls, but have to be discarded to make room for younger sheep coming on. The proof of their being good is the fact that they have survived four years' drafting. The conditions on a farm are also softer and more easy for old sheep than the vast areas on pastoral runs. When this type is procured, a suitable ram can be purchased from a reputable stud breeder, and this type and breeder always used A common mistake is to change from one stud breeder's stock to another, the result being an uneven and ragged flock. Branches of the Bureau could purchase rams in quantity on the co-operative system from the same stud, and farmers could change one with another, and so prolong the effectiveness of the rams.

SUMMARY.

1. *In this district fallow before wheat, is necessary for large returns and greater net profits.*
2. *A certain rotation must be followed; wheat land cannot be continuously fallowed and cropped under our conditions.*
3. *Fallow early and shallow, cultivate when necessary and then to a very shallow depth.*
4. *Attack weeds before they become well grown and need deeper and more costly and dangerous work.*
5. *Manure always, using from 45lbs. to 112lbs. of high-grade superphosphate per acre.*
6. *Control take-all by encouraging strong, healthy plants, especially in the early stages of growth, which is done by properly fallowing the land, sowing seed into a good seed-bed, and by increasing the amount of super, burning off affected stubble, and sowing oats.*

7. *Bunt is prevented by treating seed thoroughly with either formalin, bluestone, or copper carbonate.*
8. *Flag smut is controlled by burning stubbles, fallowing well, and using resistant varieties.*
9. *The quantity of seed per acre depends on the condition of soil as to weeds and time of sowing.*
10. *Choose correct varieties as to district and maturing qualifications.*
11. *Use only clean, true to type, graded seed.*
12. *Stock the land and judiciously work and breed the most profitable type of sheep for the district.*

RESULT OF WHEAT CROP COMPETITIONS.

SEASON, 1932-33.

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total
		Maxima—	35	25	20	15	5	100
	FLINDERS.							
	Judged by Mr. H. D. Adams (District Agricultural Instructor).							
1	R. R. Wilson, Yeelanna	Ford, 35 ac. Quality, 15 ac.	35	24	19	14	3½	95½
2	Aikenhead & Treloar, Yeelanna	Waratah, 30 ac. Gallipoli, 20 ac.	34	24	18½	14	4	94½
3	H. Glover, Yeelanna	Gallipoli, 28 ac. Dan, 22 ac. ...	34	23½	18	14	4½	94
3	Smith Bros., Yeelanna	Gallipoli	34	23½	18½	14	4	94
5	F. A. J. Hill, Brooker	Nabawa	32	23½	19	13½	4	92
6	R. R. Wilson, Yeelanna	Ghurka	31	23	18	13	4	89
6	H. Solly, South Bay.	Currawa	31	23	18	13	4	89
8	Smith Bros., Yeelanna	Ford	31	22½	18	13	3½	88
9	F. A. J. Hill, Brooker	Dan, 25 ac. .. Joffre, 15 ac. . Sepoy, 10 ac.	30	23	18	13	3½	87½
10	H. T. Pedler, Ungarra	Gluyas	29	22½	18½	13	3½	86½
11	G. and A. Lawrie, Ungarra	Nabawa	27	23	19	13	4	86
12	R. Kain, Yeelanna .	Nabawa	26	23½	18½	13	3½	84½
13	G. and A. Lawrie, Ungarra	Faun	25	23	18½	13½	4	84½
14	A. H. Griffiths, Karkoo	Nabawa, 35 ac. Gallipoli, 15 ac.	24	23	18½	13½	4	83
15	H. Earl, Yeelanna ..	Nabawa	21	24	19½	13½	4	82
16	K. Lawrie, Tumby Bay	Curley's Early.	24	23	18	12½	3½	81
17	Clarkson and Ferguson, Yeelanna	Ford	17	24	19½	13½	3½	77½
18	J. Haarsma, Yeelanna	Nabawa	18	24	19	13	3	77

SEED WHEAT FROM COMPETITIONS.

In Wheat Crop Competitions conducted in the undermentioned districts, the following competitors exhibited crops which, in the opinion of the judges, will produce grain suitable for seed purposes:—

District. Competitor. Address. Variety.

WESTERN—
F. N. Young, Warnertown—Ford and Greig's Selected.
L. C. Roberts, Port Pirie—Currawa.

ALFRED—
O. E. Klau, New Residence—Ki (Selection Late Gluyas).
G. J. Zimmermann, Meribah—Ki (Selection Late Gluyas).
A. C. Webb, Paruna—Nabawa and Gallipoli.
E. M. Edwards, Paruna—Ranee.
W. Paull & Sons, Alawoona—Nabawa.
B. L. Finey, Alawoona—Nabawa.

ALBERT—
E. J. Marrett, Wanbi—Bald Early.
Rundle Bros., Caliph—Bald Early.

RUSSELL AND BUCCLEUCH—
Sanders Bros., Karoonda—Nabawa and Sword.

CENTRAL—
J. Eden, Sheaoak Log—Waratah.
G. Hienjus & Son, Sheaoak Log—Daphne.
J. R. Smith, Smithfield—Federation.
W. A. Roediger, Gawler River—Ford and Sword.
A. M. Dawkins, Gawler River—Ford.
E. Day, Wasleys—Sword.
R. Perry, Wasleys—Sword.
B. Buckby, Wasleys—Sword.
Currie Bros., Wasleys—Sword.
M. H. Richter, Wasleys—Sword.
L. W. George, Wasleys—Sword.
J. P. Carrigg, Hamley Bridge—Sword.

SOUTHERN—
C. Brook, Woodchester—Nugget.
H. H. Cross, Woodchester—Nugget.
H. S. Stanton, Hartley—Nabawa.
E. T. & L. Jaensch, Hartley—Nabawa.
J. F. C. Paech, Hartley—Nabawa.
A. R. Strauss, Monarto South—Currawa.
Thomas Bros., Monarto South—Nabawa.
A. P. Braendler, Monarto South—Currawa.
C. F. Altmann, Monarto South—Sultan.

FRAYVILLE—
C. A. G. Faehrmann, Mannum—Nabawa.
J. O. Bottroff, Palmer—Nabawa.
I. H. Wachtel, Palmer—Nabawa.

BUXTON—
C. G. & G. W. Cant, Kimba—Waratah.
R. B. Cant, Kimba—Waratah.
C. C. Sutton, Kimba—Early Gluyas.

FAR NORTHERN—
B. Koch, Morchard—Ranee.
H. G. Kupke, Morchard—Free Gallipoli.
A. J. Twigden, Morchard—Sultan.
E. H. Hampel, Wilmington—Onas.
J. Scriven, Orroroo—Waratah.
T. A. Brown, Eurelia—Queen Fan and Waratah.

Seed Wheat Competitions—*continued.*

District. Competitor. Address. Variety.

Northern Yorke's Peninsula—
G. E. and H. M. Meier, Paskeville—Sword.
S. G. Chynoweth, Boor's Plains—Waratah.
T. Stanway, Boor's Plains—Waratah.
N. Cross, Boor's Plains—Waratah.
C. and E. Yelland, Cunliffe—Waratah.
T. Rodda, Thrington—Waratah.
J. H. Bussenchutt, Paskeville—Waratah.
J. L. Bussenchutt, Paskeville—Waratah.
M. Yelland, Cunliffe—Dahpne.
C. Rodda, Thrington—Sword.
M. H. Lamming, Paskeville—Aussie.
D. G. Harris, Paskeville—D.G.H.

Balaklava—
F. W. Sorrell, Barabba—Ford.
D. J. Wilson, Barabba—Ford.
O. L. Wilson, Barabba—Ford.
Harkness Bros., Owen—Ford, Waratah, and Sword.
L. C. Mills, Balaklava—Waratah.
O. L. Wilson, Barabba—Waratah.
R. H. Shepherd, Balaklava—Nabawa.
Bowyer Bros., Owen—Nabawa.
S. Hall, Owen—Nabawa.
J. H. Campbell, Barabba—Sword.

Mid North—
Catford Bros., Hoyleton—Sword.
A. Maitland, Rochester—Nabawa.
F. J. Pedler, Koolunga—Sword.
H. E. Wockert, Koolunga—Sword.
E. D. Whitehorn, Koolunga—Sword.
E. H. Bentley, Koolunga—Sword.
A. A. Bentley, Redhill—Sword, Waratah.
A. S. Kirk, Clement's Gap—Ford.
A. P. Kirchner, Redhill—Ford.
R. H. Badman, Yacka—Sword.
Higgins Bros., Georgetown—Nabawa.
Mrs. J. A. Lyons, Georgetown—Ford.
E. Smart, Gulnare—Nabawa.

Mid Yorke Peninsula—
J. C. Arnold, South Kilkerran—Nabawa.
S. W. Heinrich, South Kilkerran—Geeralying.
O. H. Heinrich, South Kilkerran—Geeralying.
R. E. Hasting, South Kilkerran—Dan.

Le Hunte—
S. C. Billinghurst, Minnipa—Felix.
D. V. Kitto, Minnipa—Bena.
G. Williams, Minnipa—Late Gluyas.

Chandos—
H. E. Angel, Pinnaroo—Gallipoli.
J. H. and C. H. Spratt, Lameroo—Gallipoli, Felix, Waratah, and Sultan.
C. E. Koch, Lameroo—Sultan.
P. Ross, Parrakie—Gallipoli.

Northern—
J. C. Kleinig, Laura—Nabawa.
C. Jaeschke, Wirrabara—Nabawa.
P. Curtin, Beetaloo Valley—Nabawa
F. G. Bartrum, Beetaloo Valley—Waratah.
W. D. Pearce, Gladstone—Ford.
J. J. Gale & Sons, Gladstone—Sword.
N. E. Coe, Gladstone—Dan.
J. S. Gillis, Gladstone—Sultan, Waratah.

SEED WHEAT COMPETITIONS—*continued.*

District. Competitor. Address. Variety.

NORTHERN—*Continued.*

W. M. Neate, Caltowie—Nabawa.
R. W. Batten, Caltowie—German Wonder.
J. E. Lehmann, Caltowie—Free Gallipoli.
R. W. Pearson, Jamestown—Nabawa.

MIDLANDS—

F. D. Lake, Alma—Barunga.
W. H. Brown, Alma—Sword.
F. G. Hannaford, Riverton—Sword.
A. R. Bagshaw, Saddleworth—Nabawa.
G. Hazel, Kapunda—Nugget.
P. McD. Smythe, Salter's Springs—Waratah, Ford.
Mrs. M. Glynn, Riverton—Currawa, Waratah.
C. H. Behn, Riverton—Waratah.
R. W. and L. G. Blatchford, Wirrilla—Waratah.
J. S. Lake, Salter's Springs—Ford.
L. V. Bell, Marrabel—Ranee.
F. Coleman, Saddleworth—Ranee, Gallipoli.
E. Pleuckhahn, Saddleworth—Pleuckhahn's Selection.
R. F. Kelly, Manoora; Pleuckhahn's Selection.
Frost Bros., Manoora—Gallipoli.
J. Jones, Manoora—Gallipoli.
W. R. Woods & Sons, Wirrilla—Gallipoli.
G. Ashby, Farrell's Flat—Gallipoli.
P. Kean, Farrell's Flat—Gallipoli.
T. Vogt, Saddleworth—Gallipoli.
L. W. Frost, Saddleworth—Dan.
G. Miller, Farrell's Flat—Bena.

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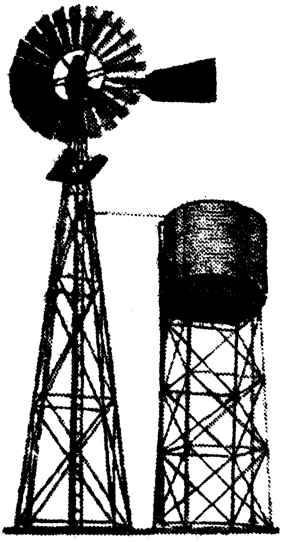

ROSEWORTHY AGRICULTURAL COLLEGE.

In a report to the Chairman of the Governing Council of Roseworthy Agricultural College (Mr. A. M. Dawkins) the Principal (Dr. A. R. Callaghan) states that a large number of visitors was shown over the College and Farm at various times during the past two months. The visitors included members of the Advisory Board of Agriculture, the Staff of the Waite Agricultural Research Institute, and members of Branches of the Agricultural Bureau at Stockport, Owen, Lyndoch, Greenock, Lone Pine, Frayville, and Roseworthy. In addition, a large party consisting of 200 paid a visit on October 16th, and was shown over the College and Farm Buildings. Several of the farmers included in the party expressed a desire to make a closer inspection, with the result that a few weeks later the Institution was visited by 82 farmers in a party organised by the Chairman and Secretary of the Freeling District Council. Over 400 have thus made an inspection of the Institution during the past two months, and have exhibited genuine and keen interest in the work of the College.

Cadetship.—Messrs. S. R. Klose and A. R. Beckwith (Diploma holders of the College, who graduated last year) have been appointed Cadets in the experimental and the vineyard and orchard sections respectively. The main object of these appointments is to give graduates at the College a special training in the technical departments of the Institution. Mr. Klose will be chiefly concerned with cereal breeding and selection and Mr. Beckwith will specialise in Viticulture and Oenology.

The College Flock.—Border-Leicester rams were put to 100 Merino ewes early in October for the production of half-bred ewes. In addition 25 Merinos and 73 Dorset Horn-Merino ewes were put to Southdown rams, for the production of early lambs. Suffolk, Ryeland, and Shropshire rams were purchased for the College at the Royal Show, and a Dorset Horn ram was presented to the Institution by Mr. W. J. Dawkins. Miss Joyce Dawkins has very kindly and generously loaned the services of a young Southdown stud ram. This will mean a lot to the Southdown stud, for with 75 stud ewes to mate, it would have necessitated the use of two different class rams. The loaned ram is similar in type and character to the one purchased, and will help considerably to establish uniformity in the flock. The kindly interset and tangible expression of the same by Mr. W. J. Dawkins and Miss Joyce Dawkins are very heartening, for which the College is deeply grateful.

General mating of the flock was continued in November. Early in the month 41 ewes, consisting of Corriedale and half-bred English Leicester-Merinos, were mated to Southdowns to provide material for twin pregnancy disease investigation. On the 22nd 125 Border Leicester-Merino ewes were mated in groups of 25 to Dorset Horn, Suffolk, Ryeland, Shropshire, and Southdown rams in an export lamb breeding experiment. In addition to the above, 60 Merinos and 62 Dorset Horn-Merino ewes were mated to Southdown rams to provide pregnant ewes for an experiment on hand-feeding.

Students' Visits.—Third year students made the following educational trips:—

The Abattoirs, under the guidance of Elder Smith's representative; students were given the opportunity of viewing the business from the agents' and sellers' standpoints.
Shearers, Kilkenny.
Hannafords, Woodville, Agricultural Implement Manufacturers.
Elder Smith's Wool Stores, Port Adelaide.
Government Freezing Works, Port Adelaide.
Messrs. Smith & Sons, Yalumba (Oenology).
Mr. R. F. Angas (Mixed Farming).
Noske Flour Mills, Murray Bridge.
South Australian Farmers' Union, Murray Bridge.

Woods Point Dairy, &c., Woods Point.
Mr. Stevenson (Subterranean Clover), Mount Barker.
Messrs. Foggitt Jones, Bacon Factory, Littlehampton.
Mr. L. T. Cowan, Blakiston.
Tweedvale Woollen Mills, Tweedvale.

Investigational Work.—Mr. J. L. Williams (Viticulturist) has set out test plots to determine the effect of topping the variety ''Grenache'' at several stages of the ''flowering and setting period'' with the object of proving or disproving the average grower's contention ''that such is an annual necessity.'' The experiment has been replicated four times, to include vines topped when half the corollas have fallen, vines topped when all the corollas have fallen, vines topped one week after flowering completed and check untopped. There are six vines in each section. Considerable difficulty was experienced in choosing vines similar or approximately equal in vigor; for this reason it was found necessary to limit each test to a total of 24 vines. This will undoubtedly give too great a margin of error for experimental proof, and therefore tests can only be regarded as preliminary or observation tests. They may serve, however, a very useful guide in laying out similar trial under more favorable conditions. In order to draw accurate conclusions from a trial of this description it would be necessary to have at least an acre of vines of the same age and relatively well grown specimens. It is intended to make provision for such a trial by planting up a fresh area in the coming season from selected cuttings. In view of the importance of the Viticultural Industry in South Australian agriculture (12.9 per cent. of the total value of S.A. crop production), and in view of the fact that South Australia is prevented from introducing new varieties under Phylloxera regulations, concerted efforts have been planned to improve our production and products by evolving new and improved varieties from those already

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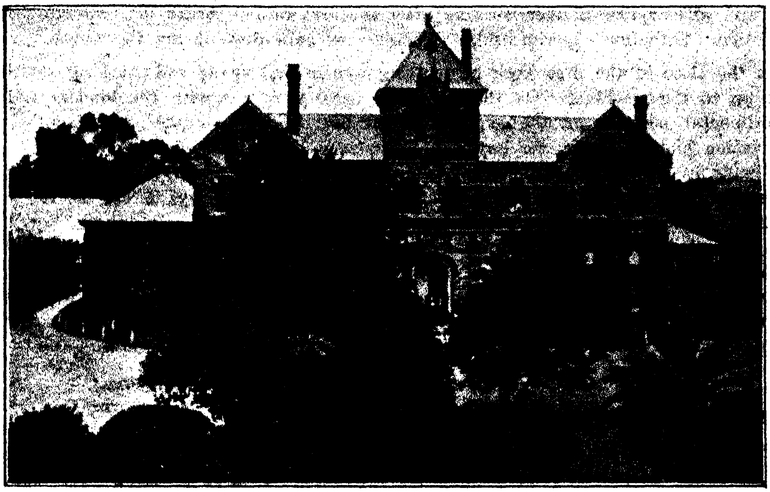
in cultivation. With the above object in view a beginning was made with this work during November, and some 29 crosses were attempted. Following is a list of the season's operations in this connection, together with a brief remark relative to the objects sought.

CROSS BREEDING, 1932.

Index.	Varieties.		Objects Sought.
	Female.	Male.	
1	Gordo Blanco...	Doradillo	Improved setting of Muscat Gordo Blanco
2	Gordo Blanco...	Albillio	Improved setting of Muscat Gordo Blanco
3	Gordo Blanco...	Sweetwater.....	Improved setting of Muscat Gordo Blanco
4	Gordo Blanco...	Aramon........	Improved setting of Muscat Gordo Blanco
5	Gordo Blanco...	White Malaga ..	Improved setting of Muscat Gordo Blanco
6	Aramon........	Frontignac	Improved cropping of Frontignac
7	Flame Tokay ..	Frontignac	Table grape with muscat character
8	Shiraz	Grenache	Improved sweet wine sort
9	Shiraz	Aramon........	Improved sweet wine sort
10	Shiraz	Doradilla	Improved sweet wine sort
11	Shiraz	Morastel	Improved sweet wine sort
12	Grenache	Shiraz	Improved sweet wine sort
13	Grenache	Aramon........	Improved sweet wine sort
14	Grenache	Sweetwater.....	Improved sweet wine sort
15	Reisling........	Early Green ...	Improved cropping variety with Reisling character
16	Reisling........	Oedrox Ximines.	Improved cropping variety with Reisling character
17	Albillio	Oedrox Ximines.	Improved sherry sort
18	Albillio	Reisling........	Variety of good cropping capacity and Reisling character
19	Sweetwater.....	Reisling........	Variety of good cropping capacity and Reisling character
20	Sweetwater.....	Pedro Ximines..	Sherry sort
21	Carbenet S.	Mataro	Improved claret sort
22	Carbenet S.	Grenache	Improved claret sort
23	Carbenet S.	White Hermitage	Improved claret sort
24	Unknown V. ...	Albillio	Wine sort with special flavor
25	Unknown V. ...	Flame Tokay ..	Table variety with special flavor
26	Mataro	Shiraz	Bulk sweet red sort
27	Cornichon Blanc	Muscat	Improved table sort
28	Cornichon Blanc	Unknown V. ...	Improved table sort
29	Parsley-Leave chasselas	Reisling........	Improved white wine sort

Fallowing Experiments.—An acre in Nottles A has been set aside for a small fallow experiment with the object of studying more closely the purpose served by fallowing. The subject has been under public notice recently, and it is felt that the experiment will give close insight into the values of fallowing, as well as serve as a useful demonstration to students. The germination of weeds on the untreated areas forms a remarkable contrast with those that have been treated and the rest of the fallow. The experiment consists of a latin square under five treatments repeated five times—(*a*) good fallow, (*b*) non-fallow, (*c*) weeded, (*d*) neglected, (*e*) reworked fallow. Moisture and nitrate determinations are being made periodically. Later the whole will be cropped as part of the paddock, and a crop analysis made.

Farm Activities in November.—The weather for the most part was unseasonable; during the first three weeks both maxima and minima temperatures were below the mean for the month, but the last four days constituted a record, being over 95° maximum on each occasion. Rainfall totalled only 11 points, compared with a mean for the month of 1.03in. for 50 years. The early part of the month was very favorable for the second cultivation of fallow, and farm operations were consequently concen-



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trated on working the fallows. The fallows are now thoroughly clean, without exception, and are in general in a very respectable condition. Graingers C was worked a little late and will require another working after the first rain to break it down into better condition. Including experimental, 454 acres were cultivated during the month.

At the close of the first week hay-cutting was in full swing and stooking was kept well up to the machines. On the farm 840 acres were cut with the binders and on experimental portions of the experiments in No. 4, the superphosphate, depth, and cultivation plots were cut for hay weighings, as well as the replication hay trial, and headlands in Georges. Stripping and harvesting became general towards the end of November, as soon as the oats were sufficiently ripened. In Days A and B, the yield of oats was high, the 40 acres under oats averaging approximately 45bush. per acre. The plot of Early Kherson gave the excellent return of 52bush. per acre. In other fields the yields were not so good, 20 acres oats in Georges yielding approximately 26bush. per acre while the Palestine oats in 6A, besides being very sparse, were badly lodged. Ten acres of oats in Crouchs B gave a return of 30bush. The total areas of grain harvested during the month, excluding experimental, were as follows:—

Oats, 85 acres. Barley, 10 acres. Wheat, 15 acres.

All experimental oats and barley were also dealt with.

The cool conditions early in the month kept the crops sappy, this, followed by the last week of exceptionally hot weather, resulted in the crops finishing very sharply, and all the wheat crops have suffered considerably as a result. The two diseases, take-all and stem rust, also asserted themselves in November, and have had a very marked effect upon the wheat crops. As a result of these factors the wheat yields are likely to be well below original estimates.

There was a decided decline in production from the dairy herd following the rapid drying off of feed, but the response to feeding on silage has been most marked. At the close of the month the milking cows were receiving silage, a small quantity of lucerne, supplemented with crushed oats. The northern silo was opened on the 24th. The seepage from it after filling was the subject of much comment and speculation, but the product is excellent, being very succulent, of attractive olive-green color, and sweet odour.

There were 25 cows under test; 14 completed their tests during the month, and of these 12 obtained their standards.

Name.	Milk.	Average Test.	Butterfat.	Standard.
	lbs.	%	lbs.	lbs.
Roseworthy Princess	8,530½	5·99	511·28	350
Roseworthy Fairy	9,435	5·05	476·63	350
Roseworthy Lady 11	7,906½	5·21	411·72	350
Roseworthy Roseal	7,042½	5·65	398·37	350
Roseworthy Princess 21	6,952½	5·54	385·19	350
Roseworthy Erudite 11	5,866½	6·30	369·86	290
Roseworthy Princess 41	6,940½	5·04	349·62	230
Roseworthy Fay	6,013½	5·56	334·35	270
Roseworthy Princess 37	5,200½	5·88	306·04	270
Rosewothy Princess 36	5,392½	5·50	296·67	270
Roseworthy Twilight	5,043	5·41	272·82	250
Roseworthy Roselar...............	5,346	4·83	258·57	270
Roseworthy Rosella	4,410	5·56	245·21	230
Roseworthy Princess 40	5,230½	4·48	234·73	250
Mean....................	6,379·29	5·42	346·50	291·42

With allowances made for age, the mean yield of butterfat from 14 cows is 390lbs.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR JANUARY.

[By Chas. H. Beaumont, District Horticultural Instructor, &c.]

Soft fruits will be nearing the end of their harvesting this month, with the exception of prunes and some plums and late peaches. It is well worth while separating the choicest fruits, marketing them on trays, and keeping the fruits apart by partially wrapping them before placing on the tray.

Spraying for codlin moth must be continued in a thorough manner; there are fewer apples, so that there will be probably a greater percentage of moth-damaged fruits. The white oil sprays are undoubtedly useful, but care is necessary when using them; rain water is wanted for mixing, and a dull day for applying. Bandages should be fixed in position and examined weekly, unless the patent bandages are used, which do not need watching.

Give all trees a good soaking with good water and use the light cultivator as soon afterwards as possible, and hoe close to trees. This specially applies to young trees and vines.

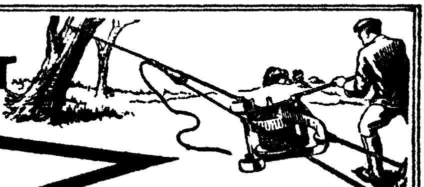
Vines will need watching for Oidium, which must not be permitted to get hold of the bunches. Prepared sulphur is the remedy and preventative.

Curculio beetle is doing considerable damage; use arsenate of lead dust or spray.

Watch for Rutherglen bug or fly. Benzole (or petrol) emulsion is recommended; tobacco dusts or sprays are useful. These insects do not like smoke.

Apple packers for export should study the export regulations and act on them, and thus lessen the chance of rejection at the wharf.

Those who are drying currants will do well not to repeat the mistakes of last season. There must be good space between the racks; 12in. is not too much. The air must have free passage over and through the bunches if reasonably fast drying is expected. Loading the racks needs attention so as not to have them sagging in one place; this can be done by loading at both ends and working regularly towards the centre.



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FRUIT CROP PROSPECTS IN SOUTH AUSTRALIA.

COMPILED AT THE END OF NOVEMBER, 1932.

[By Geo. Quinn, Chief Horticultural Instructor.]

Apples.—In the apple growing districts north of Adelaide comprising Barossa and Clare areas, wherein the Cleopatra is the most important variety, the crops are generally reported as light, still in a good number of orchards, the prospects are for a better crop than is usually obtained in their "off year" from the three or four principal sorts.

In the northern portion of the Mount Lofty Ranges the display is from fair to light, approximately 50 per cent. of a normal yield. The later sorts such as Rome Beauty—which last season was rendered unfruitful owing to the Thrips epidemic—are showing very well. In the southern portion of these ranges, whilst Jonathans have fallen badly, other sorts are reported as promising quite a fair yield. The Black Spot, however, is in evidence, particularly on the foliage. In these areas also the Rome Beauty is carrying good crops.

In the South-Eastern districts the crop is light, and is estimated at about 25 per cent. of a normal yield. From present evidences, the apple yield for the State, though light, should be much above the average of an "off" year in South Australia. In a very good year, 1,350,000 cases have been recorded, but of late years, the mean ranges around 850,000. This season, the gross yield should approximate between 400,000 and 500,000 cases.

Pears.—Pears promised a very abundant crop, but since the setting many fruits have been shed from the trees. North of Adelaide they are reported medium to light; and in the Mount Lofty Ranges, the estimate ranges from good in the south to about 60 per cent. of normal in the northern parts. Black Spot is reported as starting on these fruits in these wetter districts. In the South-East, the estimate is 50 per cent. below normal, and in the Murray Valley (principally W.B.C.) the promise is only fair to light.

Cherries.—In the principal districts the yields are promising to approximate to about one-quarter of a normal crop.

Plums and Prunes.—These fruits blossomed well, and promised a very heavy yield, but the final setting figures are much reduced. In the Barossa areas, there is a good crop of prunes and plums, but in Clare districts the present promise is for a moderate to low yield. In the wetter Mount Lofty districts the estimate is for a 75 to 80 per cent. of a normal crop. The South-Eastern plantations are reported as showing slightly below average crops. The average annual yield of plums and prunes in South Australia is about 145,000bush.

Apricots.—This fruit is reported from all districts as carrying a crop varying from good to above average. The average is approximately 260,000 cases, and this season it will probably range between that figure and 300,000 cases. There is a little "scab" showing on the fruit in some districts.

Peaches.—Reports from the various districts indicate a variation from poor to heavy crops. Where the latter is reported, the varieties grown are chiefly late ripening, yellow flesh kinds. On the whole, the crop should almost reach an average yield which is around 150,000bush. The above remarks also apply to nectarines.

Quinces.—The crop is reported as from fair to good. The average harvest in this State is approximately 25,000bush. of this fruit.

Almonds.—Crops are from fair to good, and there should at least be an average crop of slightly over 6,000cwts. of nuts harvested.

Walnuts.—These is renewed interest in planting this nut, but some years must elapse before the best named sorts will be on the market. The reports indicate an average yield on the trees, but usually a large proportion is destroyed by the walnut bacterial Black Spot. About 500cwts. constitute an average crop for the State.

Berry Fruits.—These fruits are not widely grown. Our dry summer atmosphere does not prove favorable to them if planted outside of the Mount Lofty Ranges and lower south-eastern country. This season, however, owing to the late spring rains, gooseberries, raspberries, and strawberries are more abundant than usual. Statistical records show that the average crop of strawberries is about 3,500cwts.; of gooseberries and red currants about 2,000cwts.; and raspberries a little over 2,000cwts., all of which are absorbed locally.

Tomatoes.—Glasshouse crops have been quite up to the average and the quality good. The fruit from outdoor plants are not yet in the market to any appreciable extent, but the present outlook for the crop is encouraging. This State annually produces approximately 150,000bush. of tomatoes.

Figs.—First crop figs are light, and the season is not sufficiently advanced to estimate the extent of the second or main crop.

Citrus Fruits.—The newly set navel oranges have fallen freely during November, and although these and other varieties still show a fair number of fruits, it is too early to predict what the crop will ultimately yield. Following upon two successively good yields, a crop of navels below normal is rather anticipated this year, although the trees are in good heart. Lemons promise an average crop. The average orange crop for this State ranges around 400,000bush., and that of lemons about 35,000 cases. Other types of citrus are restricted in quantities to domestic requirements, though the Pomelo is receiving more attention of late from planters.

Grapes.—With the exceptions displayed by a few small isolated frost injured areas, grape vines of all kinds in all districts of this State are in wonderful heart and promise from fair to heavy yields. Along the Murray Valley sultanas are extremely promising for a crop well above the average. Currants, on the other hand, are scarcely up to normal, but improved quality may make up the anticipated deficiency. Gordos (Muscatel) and Doradillos promise to exceed the average by from 10 to 20 per cent. From present appearances it is estimated the vines look capable of producing 12,000,000galls. of wine, 7,000 tons of Sultana raisins, 1,500 tons of Lexias, and approximately 7,000 tons of Currants.

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RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1.—WHITE LEGHORNS.

Competitor.	Address.	Score to Month ending December 31st, 1932.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
S. Austwick	West Marden	(1) 160	(2) 171	(3) 128	459
C. R. Barker	Edwardstown	(4) 69	(5) 131	(6) *	200
H. Bolland	Knoxville	(7) *	(8) 152	(9) 120	272
A. Butson	Clarence Park	(10) 162	(11) 107	(12) 153	422
A. B. Carmichael	Woodville West	(13) 107	(14) *	(15) *	107
Carroll & Leedham	Forest Gardens	(16) 82	(17) 155	(18) 161	398
W. A. Carter	Glandore	(19) 136	(20) 154	(21) 111	401
W. L. Cleland	Beaumont	(22) 144	(23) 136	(24) dead	280
B. Cooke	Kanmantoo	(25) 85	(26) 141	(27) 187	413
Syd. Cooper	Edwardstown	(28) 129	(29) 121	(30) 138	388
L. H. Crawford	Grange	(31) dead	(32) 107	(33) 142	249
R. C. Crittenden	Kilkenny North	(34) 149	(35) 193	(36) 194	536
A. G. Dawes	Glenunga Gardens	(37) 185	(38) 145	(39) 161	491
A. G. Dawes	Glenunga Gardens	(40) 116	(41) dead	(42) †	116
A. G. Dawes	Glenunga Gardens	(43) 167	(44) 128	(45) *	295
A. G. Dawes	Glenunga Gardens	(46) 160	(47) 146	(48) 115	421
A. G. Dawes	Glenunga Gardens	(49) 114	(50) 133	(51) 162	409
A. G. Dawes	Glenunga Gardens	(52) 132	(53) 202	(54) 135	469
A. G. Dawes	Glenunga Gardens	(55) 165	(56) 118	(57) 149	432
T. Duhring	Mallala	(58) 120	(59) 136	(60) 152	408
Colin J. Easther	Black Forest	(61) 170	(62) 131	(63) 177	478
J. L. Edgcumbe	Plenty, Victoria	(64) 173	(65) 166	(66) *	339
H. Fidge	Clarence Park	(67) 112	(68) 154	(69 *	266
Russell H. Fox	Edwardstown	(70) 122	(71) 103	(72) 172	397
L. H. Gilbert	Glanville Blocks	(73) 87	(74) *	(75) 145	232
Keith Goldsmith	Kensington	(76) 175	(77) *	(78) *	175
A. G. Gore	Summertown	(79) 183	(80) *	(81) 158	341
A. & H. Gurr	Scott's Creek	(82) 113	(83) 168	(84) *	281
H. H. Hefford	Murray Bridge	(85) *	(86) *	(87) 154	154
H. H. Hefford	Murray Bridge	(88) 174	(89) 130	(90) *	304
Jas. Hillyer	Kilkenny	(91) 147	(92) 167	(93) 169	483
W. H. A. Hodgson	Salisbury	(94) 111	(95) 114	(96) 117	342
E. A. Lamerton	Edwardstown	(97) 123	(98) 103	(99) *	226
E. F. Lindquist	Semaphore Park	(100) *	(101) 168	(102) 167	335
Mrs. P. G. Lindsay	Croydon	(103) 111	(104) 116	(105) †	227
H. Morris	Seaton Park	(106) 143	(107) †	(108) 112	255
K. R. McPherson	Blackwood	(109) †	(110) †	(111) 79	79
H. R. Nicholls	Eden Hills	(112) *	(113) *	(114) †	—
J. H. Oliver	Goodwood Park	(115) 137	(116) *	(117) *	137
T. B. Radbone	Colonel Light Gdns.	(118) 139	(119) 129	(120) 139	407
H. A. Rasmussen	Ethelton	(121) 157	(122) 119	(123) *	276
Woodbury Poultry Farm	Crafers	(124) *	(125) 50	(126) 138	188
Woodbury Poultry Farm	Crafers	(127) 141	(128) 172	(129) 161	474
Bruce Rowe	Two Wells	(130) 179	(131) *	(132) 148	327

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitor.	Address.	Score to Month ending December 31st, 1929.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 116	(134) †	(135) 170	286
W. C. Slape	Magill	(136) 185	(137) 128	(138) 177	490
Thomas & Elson	Hawthorn	(139) 153	(140) 120	(141) 133	406
Thomas & Elson	Hawthorn	(142) 164	(143) 161	(144) 165	490
C. C. Vowels	Westbourne Park	(145) 148	(146) 163	(147) *	311
F. F. Welford	Colonel Light Gdns.	(148) 95	(149) 124	(150) 150	369
A. P. Urlwin	Balaklava	(151) 124	(152) 143	(153) 138	405
W. Wiese	Cabra	(154) dead	(155) 112	(156) *	112
W. Wiese	Cabra	(157) *	(158) *	(159) *	—
F. J. Williams	Millswood Estate	(160) *	(161) 146	(162) *	146
W. R. Williams	Frewville	(163) 131	(164) 145	(165) dead	276
W. R. Williams	Frewville	(166) 179	(167) 93	(168) 160	432
W. Woodley	Tailem Bend	(169) 130	(170) 149	(171) 131	410
D. C. Connor	Gawler	(172) †	(173) 165	(174) 151	316
A. E. Tolhurst	Torrens Park	(175) 113	(176) *	(177) 128	241
A. & H. Gurr	Scott's Creek	(202) *	(203) *	(204) 164	164
Totals		6,617	6,215	5,911	18,743

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
V. F. Gameau	Woodville	(178) 101	(179) 126	(180) 117	344
Totals		101	126	117	344

Anconas

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
W. R. Williams	Frewville	(181) 106	(182) 110	(183) *	216
Totals		106	110	*	216

SECTION 3—BLACK ORPINGTONS.

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
N. F. Richardson	Woodville	(184) 90	(185) 195	(186) 171	456
Arthur Cook	Colonel Light Gdns.	(187) 179	(188) *	(189) †	179
B. Cooke	Kanmantoo	(190) *	(191) *	(192) 124	124
Jack Crago	Prospect	(193) 127	(194) 104	(195) †	231
L. H. Crawford	Grange	(196) 169	(197) 118	(198) 120	407
J. H. Dowling	Glossop	(199) *	(200) *	(201) *	—
F. J. Hudson	Prospect	(205) 170	(206) 136	(207) *	306
H. J. Mills	Edwardstown	(208) 127	(209) 179	(210) 206	512
H. J. Mills	Edwardstown	(211) 111	(212) 218	(213) *	329
J. Rawe	Seaton Park	(214) 192	(215) *	(216) *	192
B. O. Schubert	Tanunda	(217) 101	(218) *	(219) 103	204
G. Frisby Smith	Fulham	(220) 131	(221) 153	(222) 186	470
H. L. Twartz	Gawler	(223) 164	(224) 156	(225) 172	492
W. R. Williams	Frewville	(226) 186	(227) †	(228) 75	261
W. R. Williams	Frewville	(229) 142	(230) 172	(231) *	314
W. Woodley	Tailem Bend	(232) *	(233) 197	(234) 196	393
Totals		1,889	1,628	1,353	4,870

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
H. Fidge	Clarence Park	(235) 146	(236) 135	(237) 115	396
V. F. Gameau	Woodville	(238) 179	(239) 123	(240) dead	302
W. R. Williams	Frewville	(241) 147	(242) 80	(243) 135	362
		472	338	250	1,060

* Denotes disqualified under Rule 13. † Denotes did not lay during July.

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow December to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow December to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B	19·93	19·93	17,355½	870·80	6,903·46	843·02	42·30	311·28	4·86
6/C	23·73	21·80	18,345	773·07	7,179·81	863·35	36·38	332·21	4·71
6/F	25·63	24·13	20,044½	782·07	8,394·68	1,019·36	39·77	414·62	5·09
6/H	29·83	29·83	22,747	762·55	7,122·03	1,100·77	36·90	333·11	4·84
6/O	18	17	11,235	624·17	6,608·08	571·24	31·74	346·70	5·08
6/X	19	14	8,550	450·00	7,101·70	332·14	17·48	298·17	3·88
6/Y	22·90	16·07	9,683	422·84	5,082·23	408·84	17·85	223·87	4·22
6/Ee	40·77	23·37	17,578½	431·16	4,693·16	777·80	19·08	216·39	4·42
6/Ii	30·97	19·17	18,819	607·65	6,401·46	763·42	24·65	289·11	4·06
6/Kk	19	15·63	9,284½	488·66	5,891·40	417·34	21·97	261·72	4·49
6/Ll	22·03	15·27	10,990½	498·88	6,186·28	427·38	19·40	252·49	3·89
6/Oo	17·93	17·07	17,881	997·27	8,687·81	771·49	43·03	390·67	4·31
6/Pp	15·23	13·10	9,502½	623·93	7,435·48	460·05	30·21	360·93	4·84
6/Qq	29·80	24·77	26,051½	874·21	8,166·10	1,122·09	37·65	358·83	4·31
6/Rr	30·93	25·63	24,093½	778·97	8,129·85	963·38	31·15	345·59	4·00
6/Tt	21·60	18·03	15,346	710·46	7,462·96	686·07	31·76	341·72	4·47
6/Uu	30	22·80	17,636	587·87	6,568·67	690·27	23·01	279·04	3·91
6/Vv	26·77	23·37	24,726½	923·66	8,996·83	1,134·95	42·40	412·57	4·59
6/Xx	26·03	22·03	21,620½	830·59	7,677·55	936·58	35·98	338·13	4·33
6/Yy	27·70	22·37	16,458	594·15	6,573·05	825·48	29·80	333·88	5·02
6/Zz	26	24·63	22,198	853·77	8,751·65	1,008·38	38·78	405·98	4·54
6/AAA	22	21	15,678	713·84	5,377·74	784·70	35·74	276·38	5·07
6/A	20	19·73	16,321	816·05	Aug.-Nov. 3,127·54	789·52	39·48	Aug.-Nov. 146·71	4·84
Means	24·60	20·47	17,049·76	693·10	7,017·80	769·46	31·28	320·26	4·51

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow October to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow October to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C	33	30·03	22,262½	674·62	1,526·88	1,167·26	35·37	78·18	5·24
5/D	32	30·83	20,790	649·69	1,467·31	1,191·48	37·24	82·06	5·73
5/E	41·60	38·90	27,781	667·81	1,390·94	1,515·02	36·42	76·54	5·45
5/P	32	30·03	20,783½	649·48	1,373·34	1,059·38	33·11	70·41	5·10
5/R	65·47	59·57	31,409½	479·75	1,112·87	1,394·08	21·29	46·14	4·44
5/S	21	21	10,260	488·57	1,144·92	471·58	22·46	57·09	4·60
5/Y	29	24·27	14,752	508·69	1,186·15	809·53	27·91	63·66	5·48
5/Z	37·67	36·40	26,159	694·42	1,470·26	1,270·13	33·72	72·00	4·86
5/Ee	18	18	16,710	928·33	1,955·64	785·21	43·62	92·78	4·70
5/Ii	31·60	28·03	19,564½	619·13	1,335·66	1,015·39	32·13	67·31	5·19
5/Jj	24	23	18,510	771·25	1,733·72	788·50	32·85	74·42	4·26
5/Kk	20	16·50	10,852½	542·63	1,160·43	499·84	24·99	55·25	4·61
5/Nn	25	23·57	19,885	795·40	1,730·93	913·67	36·55	81·72	4·59
5/Oo	20	17·23	13,626½	681·33	1,549·33	607·75	30·39	70·93	4·46
5/Qq	18·80	16·47	9,478½	504·17	954·67	507·05	26·97	54·61	5·35
5/Rr	22·67	20·73	10,232½	451·36	1,045·29	611·83	26·99	61·88	5·98
5/Ss	15	14·87	9,687	645·80	1,389·16	446·72	29·78	62·76	4·61
5/Tt	10	10	7,965	796·50	1762·32	422·95	42·30	93·70	5·31
5/Uu	22·50	21·50	12,765½	567·35	1,200·11	566·94	25·20	54·51	4·44
5/Vv	22	22	16,215	737·04	1,679·02	751·28	34·15	75·02	4·63
5/Gg	23	17·50	9,972	433·56	919·19	481·13	20·92	45·04	4·82
Means	26·87	24·78	16,650·55	619·63	1,361·72	822·70	30·62	67·05	4·94

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR OCTOBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during October.	Per Cow during October.	Per Cow July to October.	Per Herd during October.	Per Cow during October.	Per Cow July to October.	
			Lbs	Lbs.	Lbs	Lbs.	Lbs.	Lbs.	%
7/E .	24·61	17·03	17,255	701·14	2,141·25	726·50	29·52	88·62	4·21
7/H .	9	6·45	6,024	669·33	2,718·85	318·49	35·39	139·47	5·29
7/K .	20·74	18·06	16,924	816·01	3,489·09	688·85	33·21	142·20	4·07
7/L .	33·90	25·10	21,613	637·50	2,505·89	1,036·00	30·56	124·98	4·78
7/T .	14	14	11,098	792·71	2,263·26	514·26	36·73	101·74	4·63
7/W .	19	17·39	16,936½	891·39	2,857·81	712·20	37·48	119·65	4·21
7/Y .	22·32	19·42	16,747½	750·33	2,552·69	764·56	34·25	119·57	4·57
7/AA	14	12·26	10,219	729·93	1,999·32	497·41	35·53	102·66	4·87
7/HH	16·48	10·65	9,501½	576·54	1,948·67	401·26	24·35	86·10	4·22
7/KK	26	20·52	21,319½	819·91	2,667·66	890·12	34·23	113·19	4·17
7/MM	37	33·52	33,233	898·19	3,501·37	1,240·63	33·53	131·86	3·73
7/NN.	24	18·87	19,654	818·92	2,785·44	823·32	34·31	116·50	4·19
7/OO	15	13·68	12,895	859·74	2,832·12	608·90	40·60	133·85	4·72
7/PP	17·97	16·97	15,829½	880·88	2,876·55	888·58	49·45	162·17	5·61
7/QQ	14	11·65	8,593½	613·82	1,964·76	496·80	35·49	114·94	5·78
7/TT	16·39	13·65	13,322½	812·84	2,676·81	583·95	35·63	124·72	4·38
7/UU.	22	19·06	15,003½	681·98	2,612·16	655·82	29·81	119·37	4·37
7/VV	11·97	11·97	10,653½	890·01	3,255·76	521·81	43·59	164·81	4·90
7/WW	15	14·84	13,596	906·40	2,765·45	681·74	45·45	139·08	5·01
7/XX	16·71	15·77	13,596	813·64	3,315·87	747·64	44·74	183·06	5·50
7/YY.	14·35	13	11,029	768·57	2,077·13	496·02	34·57	92·44	4·50
7/AAA	15	12	6,587½	439·17	1,407·78	328·70	21·91	62·40	4·99
Means	19·07	16·18	14 619·59	766·81	2,628·50	664·71	34·86	120·12	4·55

RESULTS OF BUTTERFAT TESTS FOR NOVEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Nov.	Per Cow during Nov.	Per Cow July to Nov.	Per Herd during Nov.	Per Cow during Nov.	Per Cow July to Nov.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E .	25	17·50	19,202½	768·10	2,909·35	814·06	32·56	121·18	4·24
7/H .	9	6·87	5,259½	584·39	3,303·24	257·19	28·58	168·05	4·89
7/K .	21	18·60	15,882	756·28	4,245·37	674·34	32·11	174·31	4·24
7/L .	33·83	27·58	22,083	652·76	3,158·65	1,019·03	30·12	155·10	4·61
7/T .	14	14	9,345	667·50	2,930·76	413·20	29·51	131·25	4·42
7/W .	19	17	14,691½	773·24	3,631·05	616·42	32·44	152·09	4·20
7/Y .	23·87	21·70	17,669½	740·24	3,292·93	864·43	36·21	155·78	4·89
7/AA	14	13	10,410	743·57	2,742·89	503·75	35·98	138·64	4·84
7/HH	17	12·03	10,493	617·23	2,565·90	450·97	26·53	112·63	4·30
7/KK	27·40	23·20	21,326½	778·34	3,446·00	866·37	31·62	144·81	4·06
7/MM	37	33·38	30,789½	832·15	4,333·52	1,275·72	34·48	166·34	4·14
7/NN.	23·20	21·97	20,149	868·49	3,653·93	832·15	35·87	152·37	4·13
7/OO	15	13·60	11,833	788·87	3,620·99	562·64	37·51	171·36	4·75
7/PP	20	18·57	15,326½	766·33	3,642·88	801·52	40·08	202·25	5·23
7/QQ	14·60	13·27	9,482	649·45	2,614·21	518·00	35·48	150·42	5·46
7/TT .	19	16	14,410½	758·45	3,435·26	629·85	33·15	157·87	4·37
7/UU.	22	17·93	13,524	614·73	3,226·89	609·60	21·71	147·08	4·51
7/VV	13	13	10,440	803·07	4,028·83	499·39	38·41	203·22	4·78
7/WW	14·83	14·83	12,237	825·15	3,590·60	605·76	40·85	179·93	4·95
7/XX.	19·03	17·03	14,589½	766·65	4,082·52	791·34	41·58	224·64	5·42
7/YY.	18·70	16·10	11,651	623·05	2,700·18	512·45	27·40	119·84	4·40
7/AAA	13·50	11·80	5,679½	420·70	1,828·48	279·49	20·70	83·10	4·92
Means	19·73	17·22	14,385·18	729·27	3,360·12	654·44	33·18	153·40	4·56

ANALYSES OF ARSENATES OF LEAD.

[By Geo. Quinn, Chief Horticultural Instructor, Etc.].

The following report has been received from the Director of Chemistry in respect to analyses of nine samples of Australian and imported arsenate of lead spray compounds—six powder and three paste—procured by an officer of the Horticultural Branch from Adelaide dealers recently.

These represent all of the brands procurable on the local market.

All are low in water soluble arsenic—less than 0·75 per cent. being considered safe—and, in consequence, could be used without fear of injury on trees and plants. They are all likewise possessed of a good average total arsenic content, and differ chiefly in those qualitities which make for holding in suspension in water.

Report of Director of Chemistry.

Samples (9) of arsenate of lead spray compounds have been analysed, with the following results :—

No.	Brand.	Samples as Received.			
		Moisture.	Total Lead. PbO.	Total Arsenic. (As_2O_5).	Water Soluble Arsenic. (As_2O_5).
		%	%	%	%
1	"Atomol" Dust	0·47	64·0	30·4	0·28
2	Sherwin-Williams (powder)	0·58	64·3	32·0	0·28
3	Aero (powder)	0·84	63·0	31·6	0·34
4	Electro (powder)	0·18	63·8	30·6	0·28
5	Vallo (powder)	0·46	63·5	30·0	0·17
6	Palm-Prest (powder)	0·25	63·8	31·6	0·23
7	Elephant (paste)	50·2	31·6	16·0	0·09
8	Lion (paste)	52·3	31·7	14·5	0·16
9	Blue Bell (paste)	42·3	37·2	18·1	0·31
			Oven Dry Samples.		
1	"Atomol" Dust		64·3	30·5	0·28
2	Sherwin-Williams (powder)		64·7	32·2	0·28
3	Aero (powder)		63·5	31·9	0·34
4	Electro (powder)		63·9	30·6	0·28
5	Vallo (powder)		63·8	30·15	0·17
6	Palm-Prest (powder)		64·0	31·65	0·23
7	Elephant (paste)		63·5	32·1	0·18
8	Lion (paste)		66·5	30·4	0·34
9	Blue Bell (paste)		64·4	31·3	0·54

SUSPENSION TESTS.

Powders were mixed with water in the proportion of 1¼lbs. to 50galls. of water.

Pastes.—2½lbs. to 50galls. of water.

The method of conducting the suspension test is as follows :—0·625 gram of powder or 1·25 grams of paste is washed into a mortar with a few c.cs. of distilled water and mixed with a pestle to a smooth paste which is washed with a jet of distilled water into a glass cylinder having a ground top, and the volume is made up to 250 c.cs. A ground glass plate is placed on the top of the cylinder and the cylinder is well shaken for one minute, and the liquor allowed to stand for five minutes. At the end of this period 50 c.cs. of the liquid is drawn off with a pipette from the central portion of the cylinder, avoiding, as far as possible, the formation of eddying currents. The 50 c.cs. is filtered on to paired filter papers, dried and weighed. The moisture in the sample having been determined, the percentage of dry arsenate of lead remaining in suspension is calculated on the dry basis.

The internal dimensions of the glass cylinder are 7½in. x 2in.

A determination is also made on another weighing in the same way as before, except that the cylinder is allowed to stand at rest for 30 minutes instead of five minutes.

No.	Brand.	Suspended Matter after Standing Five Minutes.	Suspended Matter after Standing 30 Minutes.
		%	%
1	" Atomol " Dust	69·4	53·2
2	Sherwin-Williams (powder)	35·4	17·1
3	Aero (powder)	80·4	52·9
4	Electro (powder)	34·1	17·6
5	Vallo (powder)	27·2	12·1
6	Palm-Prest (powder)	21·0	9·3
7	Elephant (paste)	54·9	40·2
8	Lion (paste)	5·9	3·4
9	Blue Bell (paste)	86·4	81·9

The figures obtained for suspension tests are of value in making a comparison of the spray compounds because they show those that are likely to be the most effective when applied to trees by spraying. Those arsenates of lead giving a high suspension test have a fine physical condition, and when sprayed on to fruit trees cover the fruit and foliage with a uniform very thin film of arsenate of lead which is very adherent. Those spray compounds which have a low suspension test are made up of coarser particles which have less covering power and are more easily removed from the trees by rain and other means.

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1933.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

BLACK MINORCAS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

Free on Rail, Salisbury.

DELIVERY.—CHICKS—February and Early March.
EGGS—January and February.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Victoria Square, Adelaide.

C. F. ANDERSON, Poultry Expert.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on January 3rd, 1933.

BUTTER.—The month of December was a dry one in most of the dairying areas of this State, and with the rapid withering off of the feed the result was a shortening in production of cream and butter. The London market unfortunately showed very little improvement, and overseas buyers were not at all eager to purchase. Throughout the season there was a drooping of values in London, so that the difficulty in getting stocks cleared at satisfactory prices was a very difficult one indeed. There is at present a surplus of lower grade butters which will go forward to London each week, but the supplies of choicest are now barely sufficient for local needs, and it appears that it will be necessary within the next few weeks to import some of this quality from Victoria to augment local supplies. Local prices have been maintained at fairly even rates, but the returns to producers have been lower than for very many years past, and it is to be hoped that this year a solution of the economic difficulties throughout the world will have been arrived at. Choicest creamery fresh butter in bulk, 1s. 0½d. Prints and delivery extra (these prices are subject to the stabilisation levies); store and collectors, 6d. to 7d. per lb. at store door, less usual selling charges.

CHEESE.—The production of this commodity in the South-East is still keeping up well, although there is a natural decline now evident. Exporting has continued throughout the season, and trading generally has been satisfactory, so that the floors were cleared from week to week. New makes, large to loaf, 6½d. to 7d.; semi-matured and matured, 9d. to 11d. per lb.

EGGS.—Record quantities of eggs were exported from South Australia this season, and it is pleasing to record that a good name has been established in the British markets for South Australian eggs. Shipments, however, have now ceased, and production generally throughout the State is declining. The surplus over and above local requirements is now being packed for pulp and will be disposed of for the confectioners' winter trade. Values continue steady. Ordinary country eggs, hen or duck, 4½d. per dozen; selected, tested, and infertile higher.

BACON.—The trade in bacon and hams during December was better than has been the case for several years past, the trade in hams being very satisfactory indeed. The local curers were able to cope with all demands, and generally speaking the quality was well maintained and gave satisfaction. Best local sides, 8d. to 8½d.; best local factory cured middles, 7½d. to 8d.; large, 7d.; local rolls, 8d. to 8½d.; local hams (raw), 1s. to 1s. 1d.; cooked, 1s. 3d. to 1s. 3½d.; lard, prints, 6d. per lb.

ALMONDS.—Throughout December there was a strong demand for almonds in shell, but at the close buyers had generally filled their requirements, and there was a lull in trade. However, with the opening of the new year it is expected that traders will soon get into stride again and stocks accumulated should then be cleared. Rates have continued fairly steady throughout. Brandis and softshells, 9½d. to 10d.; hardshells, 5½d. to 6d. per lb.; kernels, 2s. 2d. to 2s. 3d. per lb.

HONEY.—The demand for honey was somewhat limited throughout December, and buyers operated only for hand to mouth supplies, and until trading after the holidays has settled down somewhat the buying of parcel lots cannot be expected. Rates are steady. Prime clear extracted in liquid condition, 3d. to 3½d.; second grades, 2d. to 2½d. per lb.

BEESWAX.—Sold freely throughout the month, and there was very little accumulation of stocks from week to week. 11½d. to 1s. per lb., according to sample.

LIVE POULTRY.—The quantities of live poultry marketed this Christmas were not so great as in some other years, and this was largely due to the fact that more poultry was consumed on the farms than usual owing to the restricted spending power of the men on the land. The sales in our markets, however, were large, especially as Christmas drew near, and all lots of prime quality table birds realised very satisfactory prices. Since the opening of the new year, the quantities submitted have been limited, and we can recommend consigning. Crates loaned on application. December quotations:—Prime roosters, 3s. 9d. to 5s.; nice conditioned cockerels, 2s. 10d. to 3s. 5d.; fair conditioned cockerels, 2s. to 2s. 9d.; chickens lower; heavy-weight hens, 2s. 8d. to 3s. 9d.; medium hens, 2s. to 2s. 7d.; light hens, 1s. 5d. to 1s. 9d.; couple of pens of weedy sorts lower; geese, 4s. to 5s. 6d.; goslings, 3s. 7d. to 4s.; prime young Muscovy drakes, 4s. 6d. to 5s. 6d.; Muscovy ducks (young), 3s. to 4s.; ordinary ducks, 1s. 6d. to 2s. 6d.; ducklings lower; turkeys, good to prime condition, 11d. to 1s. 3d. per lb., live weight; turkeys, fair condition, 7½d. to 10d. per lb., live weight; turkeys, fattening sorts lower; pigeons, 3d. to 4d. each.

POTATOES.—Local, new, 5s. 6d. per cwt.

ONIONS.—New season's, 5s. 6d. per cwt.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., OCTOBER AND NOVEMBER, 1932.

IMPORTS.

Interstate.

	Oct.	Nov.
Apples (bushels)	1	892
Bananas (bushels)	8,555	10,117
Citrus—		
Grape fruit (bushels)	2	2
Lemons (bushels)	21	35
Oranges (bushels)	1	6
Passion fruit (bushels)	234	91
Pineapples (bushels)	1,038	860
Strawberries (packages)	—	3
Nuts—		
Peanuts (bags)	454	42
Peanut kernels (bags)	30	34
Walnuts (bags)	1	—
Beans (bushels)	18	—
Cucumbers (bushels)	452	1,348
Marrows (bushels)	—	24
Mixed vegetables (bags)	—	12
Potatoes (bags)	1,855	4,153
Bulbs (packages)	12	29
Plants (packages)	69	44

	Oct.	Nov
Seeds (packages)	53	59
Trees, ornamental (packages)	1	—
Wine casks (No.)	1,949	2,661
Second-hand cases (No.)	—	55
Fumigated—		
Wine casks (No.)	23	12
Second-hand cases (No.).	—	30
Scalded—		
Wine casks (No.)	—	50
Rejected—		
Bananas (bushels)	3	37½
Citrus—		
Lemons (bushel)	—	1
Pineapples (bushels)	—	23
Potatoes (bags)	27	16
Second-hand cases (No.).	—	27

Overseas.

(State Law.)

	Oct.	Nov.
Wine casks (No.)	422	670
Fumigated—Wine casks (No.)	—	2

Federal Quarantine Act.

	October.		November.	
	Packages.	lbs.	Packages.	lbs.
Seeds, &c.	1,453	227,438	8,475	318,601
Canes	65	—	189	—
Cocoanut chests	349	—	75	—
Tea chests	3,259	—	3,523	—
Timber	77,403	449,315 Super Ft.	124,062	1,589,573 Super Ft.

EXPORTS.

Federal Commerce Act.

		Pckgs.	Pckgs.
England	Oranges	4	—
New Zealand	Seeds	2	—
Netherlands, East Indies	Apples	—	20
	Oranges	107	15
	Gooseberries	—	4
	Loquats	—	1
	Potatoes	—	10

		Pckgs.	Pckgs.
Netherlands, East Indies	Other vegetables	—	5
Singapore	Vegetables	51	32
Straits Settlements	Apples	15	—
	Lemons	2	—
	Potatoes	10	—
	Other vegetables	6	—
Ceylon	Seeds	—	2

BARLEY

We have large Overseas Representation, and are in constant touch with the World's Markets, and strongly advise Growers, before selling elsewhere, to submit samples to us for valuation.

Delivery taken at any Railway Station, Siding, or Shipping Port.

F. W. HANCOCK & CO.,

CRANBROOK CHAMBERS, BENTHAM STREET, ADELAIDE.

TELEPHONE: CENTRAL 4855 and 4856.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month and to the end of December, 1932, also the average precipitation to the end of December and the average annual rainfall.

Station.	For Dec., 1932.	For Year 1932.	Av'ge Annual Rain-fall.
FAR NORTH AND UPPER NORTH.			
Oodnadatta	0·05	3·98	4·70
Marree	0·04	7·61	5·89
Farina	0·15	7·06	6·47
Copley	0·10	7·13	7·94
Beltana	0·16	7·88	8·54
Blinman	0·19	10·03	11·95
Hookina	—	9·74	11·53
Hawker	0·02	12·79	12·30
Wilson	—	12·18	11·78
Gordon	0·05	9·26	10·63
Quorn	0·06	13·69	13·29
Port Augusta	0·10	12·23	9·42
Bruce	—	10·57	9·93
Hammond	—	9·54	11·31
Wilmington	0·21	17·21	17·43
Willowie	0·20	15·19	12·19
Melrose	0·63	28·75	22·85
Booleroo Centre	0·39	19·48	15·15
Port Germein	0·32	18·56	12·43
Wirrabara	0·45	26·56	19·21
Appila	0·23	19·48	14·57
Cradock	0·12	10·91	10·83
Carrieton	0·02	11·23	12·31
Johnburg	0·04	9·58	10·61
Eurelia	—	12·01	12·87
Orroroo	0·16	14·09	13·21
Nackara	—	10·09	11·16
Black Rock	0·26	13·07	12·41
Oodlawirra	0·15	13·04	11·56
Peterborough	0·31	16·28	13·21
Yongala	0·29	17·22	14·42
NORTH-EAST.			
Yunta	0·05	10·29	8·50
Waukaringa	—	6·95	8·00
Mannahill	—	5·42	8·28
Cockburn	0·70	8·77	7·96
Broken Hill	0·32	7·09	9·63
LOWER NORTH.			
Port Pirie	0·20	18·13	13·17
Port Broughton	0·28	13·18	13·93
Bute	0·23	20·19	15·36
Laura	0·28	22·20	17·91
Caltowie	0·26	19·76	16·69
Jamestown	0·26	20·07	17·71
Gladstone	0·26	18·90	16·29
Crystal Brook	0·16	17·99	15·78
Georgetown	0·17	21·68	18·35
Narridy	0·07	17·44	15·85
Redhill	0·17	19·84	16·55
Spalding	0·16	18·83	18·99
Gulnare	0·12	22·95	18·56
Yacka	0·29	18·89	15·33
Koolunga	0·31	16·81	15·40
Snowtown	0·43	19·12	15·64
LOWER NORTH—*continued.*			
Brinkworth	0·14	18·86	15·74
Blyth	0·45	17·92	16·77
Clare	0·62	27·01	24·53
Mintaro	0·61	25·19	23·42
Watervale	0·91	26·95	26·91
Auburn	0·73	25·25	23·98
Hoyleton	0·53	18·95	17·32
Balaklava	0·68	15·42	15·49
Pt. Wakefield	0·50	14·64	12·93
Terowie	0·18	16·04	13·35
Yarcowie	0·23	16·63	13·57
Hallett	0·17	20·81	16·40
Mount Bryan	0·23	22·21	16·65
Kooringa	0·26	20·10	17·89
Farrell's Flat	0·35	19·86	18·65
WEST OF MURRAY RANGE.			
Manoora	0·58	22·81	18·83
Saddleworth	0·74	23·25	19·55
Marrabel	1·19	25·02	19·84
Riverton	1·49	23·69	20·75
Tarlee	0·85	19·00	18·11
Stockport	0·93	21·05	16·88
Hamley Bridge	0·74	20·04	16·54
Kapunda	1·07	21·43	19·79
Freeling	0·89	19·37	17·85
Greenock	0·74	22·05	21·56
Truro	0·83	19·70	19·96
Stockwell	1·21	22·21	20·12
Nuriootpa	0·85	24·45	20·64
Angaston	0·52	24·06	22·43
Tanunda	0·59	22·30	22·02
Lyndoch	0·89	24·22	23·45
Williamstown	0·51	30·68	27·71
ADELAIDE PLAINS.			
Owen	0·61	15·96	14·33
Mallala	0·63	18·16	16·56
Roseworthy	1·00	19·98	17·34
Gawler	0·67	19·73	18·96
Two Wells	0·56	18·33	15·70
Virginia	0·71	19·86	17·12
Smithfield	0·19	22·43	17·50
Salisbury	0·23	21·55	18·54
Adelaide	0·28	25·04	21·10
Glen Osmond	0·40	28·89	25·96
Magill	0·32	29·44	25·50
MOUNT LOFTY RANGES.			
Teatree Gully	0·37	28·33	27·30
Stirling West	0·84	53·82	46·91
Uraidla	0·65	55·74	43·91
Clarendon	0·73	36·86	32·82
Morphett Vale	0·50	24·43	22·64
Noarlunga	0·52	23·91	20·34
Willunga	0·28	27·26	26·01
Aldinga	0·39	23·08	20·21

RAINFALL—*continued.*

Station.	For Dec., 1932.	For Year 1932.	Av'ge Annual Rain-fall.
MOUNT LOFTY RANGES—*contd.*			
Myponga	0·40	33·29	29·48
Normanville	0·31	22·52	20·69
Yankalilla	0·42	24·59	22·85
Mount Pleasant	0·20	30·49	27·18
Birdwood	0·24	33·13	29·15
Gumeracha	0·37	36·45	33·39
Millbrook Res.	0·34	34·19	34·86
Tweedvale	0·50	39·93	35·89
Woodside	0·30	34·58	32·25
Ambleside	0·41	36·35	34·87
Nairne	0·39	31·80	28·09
Mount Barker	0·50	45·06	31·79
Echunga	0·51	39·16	33·15
Macclesfield	0·59	30·76	30·43
Meadows	0·72	40·29	36·12
Strathalbyn	0·41	18·28	19·34
MURRAY FLATS AND VALLEY.			
Meningie	0·62	21·30	18·37
Milang	0·34	17·27	14·92
Langhorne's Ck.	0·42	20·70	14·76
Wellington	0·69	21·68	14·56
Tailem Bend	1·17	24·19	14·70
Murray Bridge	0·36	15·89	13·59
Callington	0·17	16·13	15·20
Mannum	0·41	14·97	11·47
Palmer	0·34	19·01	15·43
Sedan	0·38	11·88	12·11
Swan Reach	0·54	11·15	10·60
Blanchetown	0·85	10·91	11·04
Eudunda	1·24	20·75	17·11
Sutherlands	0·48	12·84	10·82
Morgan	0·76	9·88	9·20
Waikerie	0·59	10·37	9·66
Overland Crnr.	0·59	8·61	10·41
Loxton	1·10	12·94	11·59
Renmark	0·87	10·49	10·49
WEST OF SPENCER'S GULF.			
Eucla	0·77	10·41	9·98
Nullarbor	0·29	13·57	8·73
Fowler's Bay	0·35	18·14	11·82
Penong	0·75	16·83	12·12
Koonibba	0·58	18·15	11·82
Denial Bay	0·65	13·21	11·36
Ceduna	0·64	15·47	9·95
Smoky Bay	0·96	14·38	10·28
Wirrulla	0·36	14·23	10·08
Streaky Bay	0·71	18·37	14·82
Chandada	0·75	15·81	—
Minnipa	0·41	17·92	13·68
Kyancutta	0·34	16·89	—
Talia	0·30	17·41	14·63
Port Elliston	0·25	22·32	16·39
Yeelanna	0·05	21·44	15·72
Cummins	0·09	22·08	17·35
Port Lincoln	0·22	25·57	19·34
Tumby	0·09	19·58	13·92
Ungarra	0·33	19·94	16·73
Carrow	0·02	14·74	13·08
Arno Bay	0·36	17·16	12·44
WEST OF SPENCER'S GULF—*contd.*			
Rudall	0·28	17·98	12·19
Cleve	0·37	21·70	14·66
Cowell	0·17	11·81	11·10
Miltalie	0·21	18·08	13·54
Darke's Peak	0·15	20·48	14·92
Kimba	0·34	15·38	11·52
YORKE PENINSULA.			
Wallaroo	0·45	19·46	13·91
Kadina	0·34	20·15	15·61
Moonta	0·38	17·52	15·05
Paskeville	0·40	18·28	15·46
Maitland	0·48	23·69	19·90
Ardrossan	0·23	16·71	13·93
Port Victoria	0·25	20·14	15·40
Curramulka	0·30	21·49	17·87
Minlaton	0·17	20·67	17·80
Port Vincent	0·38	17·25	14·40
Brentwood	0·08	19·76	15·45
Stansbury	0·31	18·50	16·81
Warooka	0·11	18·75	17·51
Yorketown	0·47	16·83	16·94
Edithburgh	0·11	19·52	16·34
SOUTH AND SOUTH-EAST.			
Cape Borda	0·22	27·03	24·83
Kingscote	0·59	21·80	19·11
Penneshaw	0·70	22·24	18·85
Victor Harbor	0·69	28·35	21·27
Port Elliot	0·56	22·36	19·91
Goolwa	0·55	22·11	17·81
Copeville	0·51	14·06	11·44
Meribah	2·02	15·50	11·10
Alawoona	0·83	12·99	10·02
Mindarie	1·09	17·61	11·91
Sandalwood	0·65	16·44	13·57
Karoonda	0·57	16·79	14·33
Pinnaroo	0·67	15·36	14·54
Parilla	0·83	16·23	13·90
Lameroo	0·37	16·48	16·08
Parrakie	0·16	18·21	14·49
Geranium	0·44	19·37	16·41
Peake	0·89	18·49	16·03
Cooke's Plains	0·41	17·55	15·38
Coomandook	0·47	19·75	17·11
Coonalpyn	0·44	22·94	17·42
Tintinara	0·75	22·79	18·60
Keith	0·60	20·26	17·87
Bordertown	0·83	21·16	19·22
Wolseley	1·04	23·15	18·41
Frances	0·74	20·95	19·99
Naracoorte	0·91	25·14	22·59
Penola	0·62	24·86	26·06
Lucindale	0·84	29·75	23·16
Kingston	0·57	26·42	24·33
Robe	0·56	27·47	24·64
Beachport	1·16	34·16	26·93
Millicent	1·23	32·82	29·76
Kalangadoo	1·43	37·97	32·03
Mount Gambier	1·53	32·72	30·52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.		Branch.	Report on Page.	Dates of Meetings.	
		Jan.	Feb.			Jan.	Feb.
Alawoona	*	—	—	Farrell's Flat	*	27	24
Aldinga	*	—	—	Finniss	†	—	—
Allandale East	*	6	10	Frances	705	R	1
Alma	*	—	—	Frayville	*	—	—
Amyton	*	—	—	Gawler River	*	—	—
Angaston	*	—	—	Georgetown	*	7	4
Appila	708	—	—	Geranium	*	28	25
Appila Yarrowie	*	—	—	Gladstone	*	6	10
Arthurton	*	—	—	Gladstone Women's	†	13	10
Ashbourne	728	11	8	Glencoe	*	10	14
Auburn Women's	700	27	—	Glossop	*	—	—
Balaklava	*	R	27	Goode	*	12	9
Balhannah	†	—	—	Goode Women's	*	12	9
Balumbah	722	—	—	Greenock	710	16	13
Balumbah Women's	701	—	1	Green Patch	723	12	9
Barmera	*	R	—	Gulnare	*	—	—
Beetaloo Valley	*	R	6	Gumeracha	*	9	13
Belalie Women's	†	—	—	Halidon	*	—	—
Belvidere	*	—	—	Hanson	*	R	7
Berri	*	9	13	Hartley	†	11	8
Big Swamp	*	—	—	Hawker	*	—	—
Blackheath	†	12	16	Hindmarsh Island	733	—	—
Black Rock	*	—	—	Hookina	*	—	—
Black Springs	*	R	—	Hope Forest	†	—	6
Blackwood	728	R	8	Hoyleton	*	16	20
Block E	2	—	—	Inman Valley	*	19	16
Blyth	*	27	24	Ironbank	*	—	—
Booleroo Centre	*	6	10	Jamestown	*	18	15
Boolgun	*	—	—	Jervois	†	12	9
Boor's Plains	727	R	3	Kalangadoo Women's	*	14	11
Borrika	1	—	—	Kalangadoo	*	14	11
Bowhill	*	9	6	Kalyan	*	18	15
Brentwood	721	3	2	Kangarilla	†	—	—
Brinkley	2	11	8	Kangarilla Women's	*	19	16
Brinkworth	*	9	6	Kanmantoo	*	—	—
Brownlow	*	—	—	Kanni	*	—	—
Buchanan	*	—	—	Kapinnie	†	R	R
Bugle	*	10	14	Kapunda	*	13	10
Bundaleer Springs	*	—	—	Karcultaby	*	—	—
Bute	*	19	16	Karoonda	*	11	8
Butler	*	—	—	Keith	*	12	9
Calca	*	—	—	Kelly	*	7	4
Cadell	*	—	—	Ki Ki	*	—	—
Caliph	*	3	7	Kilkerran	*	12	9
Caltowie	*	—	—	Kongorong	*	9	6
Canowie Belt	*	—	—	Koolunga	*	—	—
Caralue	*	11	8	Koonibba	*	5	9
Carrow	*	11	8	Koonunga	†	—	—
Chandada	*	—	—	Koppio	*	10	7
Charra	*	—	—	Kringin	*	9	13
Cherry Gardens	†	—	—	Kulkawirra	*	10	14
Clanfield	*	—	—	Kyancutta	*	R	7
Clare Women's	†	—	—	Kybybolite	*	12	9
Clarendon	*	9	6	Kybybolite Women's	*	10	7
Cleve	*	7	4	Lameroo	*	7	4
Cobdogla	*	—	—	Langhorne's Creek	*	11	8
Collie	*	4	1	Laura	*	14	11
Colton	*	—	—	Laura Bay	728	10	14
Coomandook	*	26	23	Lenswood & Forest Range	731	—	—
Coonalpyn	*	—	—	Light's Pass	710	—	—
Coonawarra	†	12	9	Lipson	*	7	4
Coonawarra Women's	*	R	R	Lone Gum and Monash	*	11	8
Coorabie	*	—	—	Lone Pine	*	9	6
Copeville	*	—	—	Longwood	*	—	—
Coulta	*	—	—	Lowbank	*	11	8
Cradock	*	—	—	Loxton	*	13	10
Cummins	*	13	10	Lucindale	*	—	—
Cungena	*	5	2	Lyndoch	†	10	7
Currency Creek	*	9	13	McLaren Flat	*	—	—
Cygnet River	*	—	—	McLaren Flat Women's	†	8	2
Darke's Peak	*	—	—	Macclesfield	†	19	16
Dudley	*	—	—	MacGillivray	*	10	7
Edillilie	*	—	—	Mallala	*	16	20
Elbow Hill	*	10	7	Maltee	*	R	9
Eudunda	*	2	6	Mangalo	†	R	—
Eurelia	709	14	11	Mangalo Women's	701	—	—
Eurelia Women's	701	4	1	Mannanarie	*	—	—
Everard East	*	—	—	Marama	*	—	—
				Meadows	*	12	8

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Branch.	Report on Page.	Dates of Meetings. Jan.	Dates of Meetings. Feb.
Meribah	*	R	R
Milang	*	R	8
Millendilla	*	—	—
Millicent	*	27	24
Millicent Women's	†	R	R
Miltalie	723	R	4
Mindarie	*	6	8
Minnipa	*	—	—
Modbury	*	—	—
Monarto South	*	—	—
Moonta	*	—	—
Moorlands	728	14	8
Moorook	*	—	—
Morchard	†	R	10
Morphett Vale	*	—	—
Mount Barker	*	16	20
Mount Bryan	*	—	—
Mount Compass	†	R	22
Mount Gambier	†	13	10
Mount Hope	*	10	7
Mount Pleasant	*	—	—
Mount Remarkable	*	—	—
Mount Schank	*	—	—
Mudamuckla	*	14	11
Mundalla	†	—	—
Mundalla Women's	†	12	9
Murray Bridge	*	—	—
Murraytown	*	—	—
Mypolonga	*	—	—
Myponga	†	19	16
Myrla	*	12	8
Nantawarra	*	12	9
Naracoorte	*	14	11
Narridy	*	—	—
Narrung	731	—	—
Nelshaby	*	—	—
Nelshaby Women's	*	—	—
Netherton	*	11	8
New Residence	*	—	—
North Booborowie	*	—	—
Nunjikompita	*	12	9
Nunkeri	*	11	8
O'Loughlin	*	9	13
Orroroo	*	—	—
Overland Corner	*	11	8
Owen	712	—	10
Palabie	*	R	—
Parilla	*	R	R
Parilla Women's	*	18	15
Parilla Well	*	9	13
Parilla Well Women's	*	31	28
Parrakie	*	—	—
Parrakie Women's	702	31	28
Paruna	*	R	R
Paskeville	*	10	7
Pata	*	6	3
Penneshaw	*	—	—
Penola	*	—	—
Penola Women's	702	7	4
Penwortham	712	12	9
Petersville	*	10	7
Petina	*	28	25
Pinbong	725	—	—
Pinkawillinie	*	—	—
Pinnaroo	*	—	—
Pinnaroo Women's	708	13	10
Port Elliott	*	R	18
Pygery	*	R	7
Pygery Women's	†	—	—
Quorn	*	9	6
Ramco	*	—	—
Rapid Bay	*	—	—
Redhill	*	7	4
Rendelsham	†	—	—
Renmark	*	—	—
Rhynie	*	12	9
Richman's Creek	*	9	13
Riverton	*	—	—
Riverton Women's	*	—	—
Roberts and Verran	*	—	—
Rosedale	*	—	—
Roseworthy	*		

Branch.	Report on Page.	Dates of Meetings. Jan.	Dates of Meetings. Feb
Rosy Pine	*	—	—
Rudall	*	10	7
Saddleworth	*	18	10
Saddleworth Women's	*	8	7
Salisbury	*	—	—
Salt Creek	*	—	—
Sandalwood	707	—	—
Scott's Bottom	*	6	3
Shoal Bay	*	10	7
Smoky Bay	*	—	—
Snowtown	*	13	10
South Kilkerran	721	10	7
Spalding	*	—	—
Springton	*	4	1
Stanley Flat	*	16	20
Stirling	*	—	—
Stockport	713	—	—
Strathalbyn	732	—	—
Streaky Bay	*	27	24
Tailem Bend	*	19	16
Talia	*	27	24
Tantanoola	707	7	4
Tantanoola Women's	703	4	1
Taplan	†	R	R
Taragoro	725	12	9
Tarcowie	*	—	—
Tarlee	*	—	—
Tarpeena	*	—	—
Tatiara	*	—	—
Thrington	*	—	—
Tintinara	*	—	—
Truro	715	R	20
Tulkineara	*	12	9
Tweedvale	*	19	16
Two Wells	*	—	—
Ungarra	*	19	16
Upper Wakefield	*	R	—
Uraidla and Summertown	*	2	6
Veitch	*	—	—
Virginia	*	—	—
Waddikee Rocks	*	7	4
Waikerie	*	13	10
Wallala	*	11	8
Wanbi	*	25	22
Wandearah	*	10	7
Warcowie	709	R	R
Warcowie Women's	704	R	R
Warramboo	†	R	7
Warramboo Women's	*	R	3
Wasleys	*	12	9
Wasleys Women's	704	5	2
Watervale	†	16	20
Wauraltee	*	10	7
Weavers	*	9	13
Wepowie	*	29	6
Whyte-Yarcowie	*	—	—
White's River	*	—	—
Wilkawatt Women's	*	—	—
Williamstown Women's	705	4	1
Williamstown	*	—	—
Willowie	*	23	27
Wilmington	710	R	14
Windsor	*	—	—
Wirrabara	*	—	—
Wirrilla	*	R	9
Wirrilla Women's	*	5	2
Wirrulla	*	18	15
Wolseley	†	8	13
Wudinna	725	—	—
Wynarka	*	—	—
Yacka	*	—	—
Yadnarie	*	R	7
Yallunda Flat	*	—	—
Yandiah	*	27	10
Yaninee	*	—	—
Yantanabie	*	—	—
Yeelanna	*	11	8
Yorketown	*	—	—
Younghusband	*	—	—
Yurgo	*	R	R
Yurgo Women's	*	—	—

* No report received during the month of December. † Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

REPORTS OF BUREAU MEETINGS.

WOMEN'S BRANCHES.

AUBURN (Average annual rainfall, 23.98in.).

October 28th.—Present: 18 members.

Rearing Turkeys.—Mrs. J. S. Miller read the following paper:—"There are several varieties of turkeys in Australia, the Bronze, White, Buff, and Crested. The latter is extremely rare, differing from the others only in the possession of a feathered crest, which is somtimes white and sometimes black. There is, however, one fact peculiar to the turkey—it still retains and persistently holds many of its wild traits. It is shy, untractable, and like the pea-hen and guinea fowl, is much inclined to wander, so that one has to be careful to see they are all home for the night feed or foxes will cause losses. The white turkey is spoken of as being the most common, and less inclined to wander, and if fattened at 7 or 8 months will weigh from 10lbs. to 12lbs. The bronze or Bronze-wing turkey is the most popular in this part of the State, and develops into a really good table bird at the same age. Turkeys hatched at the end of October or early in November should be fattened and sent to market by June and July, before the hens start laying again. Turkeys when full-grown—indeed after they become fully fledged—are very hardy, yet when young they are most delicate, and for that reason, hatching is best left until the warm weather, and even then care must be taken not to let them get wet, or run out in morning dew. The turkey hen is a very careless mother and poor provider for her young. For this reason many prefer to raise them with a hen. A good size hen will cover from 7 to 9 eggs and bring them out quite successfully. A turkey hen will cover 16 or 18 eggs and bring them out quite satisfactory, but she is a wild and greedy mother for a few days. The first week I feed bran 2 parts and pollard 1 part, as dry as can be mixed, then half and half for 2 or 3 months, then wheat twice a day until ready to fatten, for which I favor soaked or crushed wheat, bran, and pollard."

Hatching and Rearing of Turkeys.—Paper read by Mrs. W. Jones:—"Artificial means of hatching are not recognised as being very successful for turkeys, therefore the natural method of hatching should be employed. As broody hens are plentiful during the period when turkeys should be hatched, this presents no difficulties, for, unlike several other branches of poultry-rearing, winter hatching is not advisable, eggs being not very plentiful then, and especially as it is hard to rear the poults successfully. August and September are ideal months for hatching, the weather being warmer, and at that time there is plenty of natural green feed. The period of hatching extends over about 30 days, and during this time the eggs should be interfered with as little as possible. Some test the eggs on the seventh or eighth day, and removing all infertile eggs, make it possible to place remaining fertile eggs under fewer hens. A turkey hen will cover 20 eggs if she is a well grown bird. If the weather is dry, the earth around the nest should occasionally be soaked with water, as an insufficient supply of moisture has an injurious effect on results, and watering the earth around the nest is a much better plan than sprinkling the eggs. The day previous to hatching it is a good plan to dip the eggs in warm water, this has the effect of softening the inner and outer membranes and making the exit of the chick more easy. This lessens the danger of what is frequently termed "dead in shell." The turkey poults should be allowed to thoroughly dry before being removed from the nest, for they easily catch a chill. The feeding of young turkeys entails a good deal of labor, considerably more attention is needed to be given to them than to ordinary poultry. During the first week or two they should be fed at frequent intervals, generally reducing the number of feeds until, when they are about 8 weeks old, two or three meals are sufficient. The dry system of feeding—so excellent for ordinary chicks—cannot be regarded as altogether successful. Turkeys seem to require moist food. The first feeds should consist of hard boiled egg finely chopped and mixed with bread crumbs. Plenty of finely chopped green feed is also essential, including finely chopped green onion. Later feeding on bran or pollard, made into a mash, and grain is recommended. A very convenient coop is one made of netting without a bottom, and as the poults get a little older this can be moved, thus allowing them to pick green feed for themselves."

BALUMBAH.

November 2nd.—Present: Nine members.

Miss C. Riches read a paper, ''The Uses of Hessian in the Home,'' compiled from an article written by Miss G. Campbell. [*Copies of this Bulletin can be had on application to the General Secretary, Agricultural Bureau.*—Ed.] (Secretary, Miss C. M. Riches.)

EURELIA (Average annual rainfall, 12.87in.).

October 29th.—Present: 12 members.

Household Hints.—The following were given by Miss I. Polden:—''*Economical Hints for the Home*—Women can do much to cut down expenses in the home by using whenever possible products of the farm for cooking in preference to goods purchased from the store. For instance, puddings and dishes made of milk, eggs, or butter are much cheaper and far more nutritious than specially prepared foods. All jams, pickles, and sauces can be made at very little cost, especially if the vegetables and fruits are grown in the farm garden. Any food left over from meals should be kept clean and cool and used whenever possible. One can do much to avoid left over foods by making a careful study of the average appetite of the family and thereby cooking just sufficient for each meal. It is not advisable to make large dishes of sweets, because this food always tastes better when freshly made. A very successful way of warming left-over vegetables is to place them in a steamer with the lid on and put in a hot oven 30 minutes before a meal. Vegetable heated this way is nearly as nice as when freshly cooked. Endeavor to be clever with the needle and thereby cut down expenses by doing most of the household sewing and remodelling of frocks and hats, a work that is quite necessary under existing conditions. Baking bread in the home is another way of reducing expenditure, not only because it is cheaper, but for people who live some distance from a township much travelling can be saved. When bread becomes stale it can be made like new if placed in a hot oven for 20 to 30 minutes.'' (Secretary, Mrs. E. Wall.)

MANGALO (Average annual rainfall, 14in. to 15in.).

October 19th.—Present: 12 members.

Management of the Home.—Paper read by Mrs. F. Coles:—''To manage a home thoroughly it is necessary to rise at a reasonable time every morning right throughout the year and do all work to schedule time. Rise between 6 and 6.30 a.m. in summer and winter. Have the fire and breakfast table set overnight, then while the porridge is cooking and the kettle boiling, prepare vegetables for the day, turn back bed clothes for airing, clean fireplaces (in winter months), then breakfast should be ready. When breakfast is over, wash the separator and dishes, sweep kitchen floor, make beds, and tidy bedroom. On Monday, as soon as these jobs are completed, start washing, the copper having been lit half an hour previously; washing will then be finished before dinner. After the mid-day meal clean washhouse and tidy the yard, then gardening or any other odd jobs can be done. On Tuesday mornings make bread, pastry, and butter; in the afternoon do the ironing. On Thursdays clean all rooms except kitchen, bathroom, and pantry; on Fridays do out the latter rooms. Make butter again and any other necessary work. Saturday mornings are then left for baking and cooking for the week end. Keep Saturday afternoons free for recreation or hobbies. Sundays rest as much as possible. To economise in as many ways as possible is essential to success. There are many ways in which this can be done. Often stale bread may be used up in puddings, for fritters, and other tasty dishes, and many articles of food which are left over can be made up into totally different dishes. Farm housewives need never buy soap if meat is killed on the place. All that is needed is to render the fat down and make soap with it. Purchase necessaries for the house in large quantities, there is always a fair reduction when one buys in this way. The essential point in time saving is to keep to regular hours as much as possible. This will give one more time for work, other than the daily household tasks; and finally, a good housekeeper must be energetic.''

How a Wife and Children of School-going Age can Help in Times of Depression.—Mrs. P. Cleave read the following paper:—''If a farmer is not in a position to keep help, he has as much as he can manage without attending to side-lines, and it is here that the wife and children can be of valuable assistance. First of all bring up the children so that they are not afraid of work. The girls can feed the pigs and fowls and bring in the horses and cows. The boys can help by cooking the breakfast, sewing on a button, or mending a hole in their socks. *Cows*: Three should be ample, they will keep the home in dairy produce and leave a balance for sale. Three calves each year will bring in a few pounds. Pigs will be useful to dispose of the buttermilk and any other surplus milk. Some of the pigs raised from the sow can be killed for fresh meat; others can be cured for bacon and hams, &c. *Fowls*: 50 to 100 will be sufficient for home use and market. Surplus roosters will make a change in the diet. Hams are very nice for the summer when the weather is too hot to kill fresh meat. A vegetable garden will prove a valuable asset during the summer, with tomatoes, cucumbers, lettuces, red beet, &c. Do not forget a few flowers for brightening up the home. The side-lines require morning and evening attention, and the children will be able to help in their management before and after school.'' (Secretary, Mrs. B. Coles.)

PARRAKIE (Average annual rainfall, 14.49in.).

October 31st.—Present: 12 members.

The meeting took the form of a fancywork display and social afternoon, and was conducted by Misses Herbert, Halliday, and Hamilton, who gave a fine display of fancywork. Miss Halliday gave a short paper on ''Fancy Stitching'' and Miss Herbert a paper on ''Embroidery in Ancient Times.'' The fancy stitching competition arranged by Miss Herbert was won by Mrs. E. Ross.

PENOLA (Average annual rainfall, 26.06in.).

September 7th.—Present: 27 members.

UTILISATION OF CITRUS FRUITS.—The following recipes were given:—*Lemon Filling* (Mrs. Provis): 1lb. sugar, ¼lb. butter, yolks of 6 eggs, whites of 4 eggs, juice of 3 lemons, grated peel of 2 lemons; put all in saucepan over fire and simmer until sugar dissolves; stir gently one way all the time until cooked; keeps well in closed jars. *Simple Marmalade* (Mrs. W. Mitchell): 4lbs. poorman oranges, 4qts. water, 12lbs. sugar; slice oranges, removing cores and pith, add water and stand over night; next day boil oranges and water 1 hour; add sugar and boil rapidly about 20 minutes. *Orange, Dried Apricot, and Melon Jam* (Mrs. J. Doman: 1lb. dried apricots, 5lbs. melon, 2 lemons, 2 oranges, 5lbs. sugar; soak apricots 2 hours in hot baking soda water, strain and soak all night in 2½ pints cold water; peel and put through mincer the melon, oranges, and lemons, and boil with the apricots; when boiling add the sugar, which has been heated in the oven, and cook 3 hours. *Methods of Storing Lemons*: (1) Grease lemons well with dripping and wrap in paper and keep in cellar; (2) pack in sand. *Lemon Jam* (Miss K. S. Laram): Slice very thinly 6 large lemons, soak with 3 pints of cold water overnight; put in pot next day and boil for 2 hours; then add 4lbs. sugar, and boil quickly for 1 hour or until it jellies; bottle, and when cold tie down. *Sweet Orange Conserve* (Mrs. Redman): Slice finely navel oranges, add 1 pint water to each 1lb. fruit; boil ¾ hour or until soft; measure and add 1 cup sugar to cup of pulp and juice of 2 large lemons to every 3lbs. fruit; boil ¾ hour. *Grape Fruit Jam* (Mrs. S. Rickard): To 6 grape fruits of medium size allow 12 pints of water and 6lbs. sugar; slice the grape fruit thinly and cover with water and stand all night; next day bring to boil and strain off water; measure this water and put back on fruit the same quantity of fresh water and stand 12 hours; strain again and replace as before with fresh water; this will help to get rid of the excessive bitter taste; bring to boil and boil steadily until fruit is clear and soft; add the warmed sugar and stir until it boils; boil steadily until it jellies. *Orange Tart* (Mrs. Balnaves): Take 2 dessertspoons of corn, juice of 2 oranges and 1 lemon, 2 tablespoons honey, yolk of 3 eggs (beaten), and ½ cup sugar; line dish with short pastry; mix cornflour with little cold water, and add cup boiling water; stir in lemon and orange juice; add honey; and when boiling add yolk of eggs; line dish with pastry, and when cooked add, with whites of eggs beaten with little honey, on top.''

Mrs. T. Kidman read the following paper:—''Lemons and oranges can be utilised in many different ways. The salts and acids from the lemon are natural digestive aids. A slice of lemon is more than a decorative garnish. Its healthful juice when used in place of vinegar on fish and vegetables is a digestive aid . To obtain the best results for the juice of the lemon try rolling it back and forwards on the table before putting it on the lemon squeezer. Stale vegetables can be made quite fresh by adding the juice of lemon to the water in which they are soaked. This also applies to carrots. Lemon juice and salt will take ink stains from white tablecloths; it can be used for colds or cleansing the hands, coppers, boots, and brassware. When lemon or orange peel is required for flavoring, it must be removed thinly. The grated rind is best rubbed in sugar to bring out the flavor. The white pith of the orange can be used for making orange pectin for adding to jams to make it jelly easily. The sugar out of purchased lemon peel makes a delicious flavor added to rhubarb pies. Candied peel is also very nice added to the above pies. Candied peel is undigestible, should never be cut in large pieces; if the peel becomes very hard, soak in boiled water a few minutes. A very quick way of slicing lemon or orange peel is to run it through the mincer and put away in jars ready for use. When preserving peel the most economical method is to cut it into small pieces so that they sink into the syrup. Use the pieces just as they are peeled from the fruit from day to day, and when sufficient are obtained one can begin preserving. The following recipe is reliable:—*Candied Orange or Lemon Peel.*—Soak peel in salted water for 3 to 4 days; if left longer add a fresh supply of salted water. Drain and bring to boil in clean water to soften it. Make a syrup by boiling 2 cups sugar with 1 cup water for 5 minutes and put peel, which has well drained, into basin and pour syrup over it. Let stand for 5 to 6 days, then drain off syrup and boil 20 minutes. Put peel into syrup and boil on a slow fire until clear. If required, put a little of syrup in halves and dry in sun or a cool oven. *Vienna or Butter Filling.*—3ozs. fresh butter without salt, 4ozs. icing sugar. Cream together, then add grated rind of orange or lemon, to which a little sugar has been added.''. (Secretary, Mrs. F. Kidman.)

PINNAROO (Average annual rainfall, 14.54in.).

October 7th.—Present: 17 members.

TOMATO GROWING.—The meeting, attended by a large number of visitors and members from the Men's Branch, was held at the residence of Mrs. J. Longford, who read the following paper:—''It is first necessary to prepare the land some time ahead of planting by applying a heavy dressing of manure and digging it in, then dig it up again before setting out the plants. Have the seedlings ready to plant out about the end of August or beginning of September. The Early Dwarf Red is the best variety to get an early crop, and if they are pruned when they start flowering the tomatoes will be earlier. It is not advisable to plant tomatoes in holes with the foliage spreading out on the hot, dry ground because it scorches the leaves and fruit. It is much better to have them planted so that the ground is kept moist and the plants can all grow in together to shelter and protect the fruit. Old cocky chaff or straw spread all over the ground helps to keep the earth cool. Once the plants have taken root and got a start, it is best not to water too much until the fruit is set, and then a good watering once or twice a week is more beneficial than a little water given more frequently. The longer period between growing tomatoes on the same ground the better will be the results obtained.'' Secretary, Mrs. F. Atze.)

TANTANOOLA WOMEN'S.

November 8th.—Present: Nine members.

Mrs. J. Tooth read the following paper on ''Jam Making'':—''The first essential is fresh, ripe fruit, then wash all fruit well and weigh. The following fruits can be prepared in the morning and cooked at night:—Blackberry, black currant, white currant, red currant, raspberry, strawberry, melon. These soft fruits I put on to boil at once, but most other kinds, such as plums and apricots, should be prepared over night.

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Recipes.—*Gooseberry Jam*—1lb. sugar to 1lb. fruit; prepare at night and nearly cover with water. In the morning put on to boil until all the water is boiled off; then add the sugar, and boil one hour from when it starts to boil. *Melon and Pineapple*—Cut up pie melon in the morning and put in 6lbs. sugar to 12lbs. melon and 2lb. tin of preserved pineapple and juice. Boil until it jellies. *Strawberry Jam*—Mash the fruit and add 1lb. sugar to 1lb. fruit and boil 15 minutes from the time it boils. Black currant, 12ozs. sugar, boil 45 minutes; white currant, 14ozs. sugar, boil 45 minutes; raspberry, 14ozs. sugar, boil 45 minutes; blackberry, 12ozs. sugar, boil 30 minutes; red currant, 14ozs. sugar, boil 45 minutes. *Mulberry*—1lb. sugar to 1lb. fruit, boil 30 minutes. *Apricot Jam*—Prepare over night, break the fruit, and take out most of the stones. Leave a few stones or put in kernels. Use 1lb. sugar to 1lb. apricots. put all the sugar on over night and leave for 48 hours; then stir and boil for one hour from the time it starts to boil, and keep skimming off the froth in a basin. In most plum jams I use 1lb. sugar to 1lb. of fruit. I prefer ripe fruit, because not so much water is needed. For sweet plums use ¾lb. sugar to every 1lb. fruit. Always boil about one hour from the time it starts to boil. *Green Tomato Jam*—12lbs. green tomatoes, slice ¾lb. lemon peel, 6lbs. sugar, ½ teaspoon acid, ½lb. green ginger or preserved, 5 cups water; boil well. *Fig Jam*—1lb. sugar to 1lb. of fruit, and add a lot of water at first and boil to a pulp, then cut up ½lb. preserved ginger. Boil 1 hour from the time it starts to boil. Paste with brown paper and keep in a dry place.'' (Secretary, Mrs. E. Telfer.)

WARCOWIE (Average annual rainfall, 11.42in.).

November 8th.—Present: Five members.

SUMMER RECIPES.—The following paper was read by the Hon. Secretary (Mrs. A. Crossman):—''One of the most important points in preparing summer dishes is to serve them as dainty and fresh looking as possible. Use dainty dishes, and a glass dish of fruit has a very appetising appearance if stood on a plate in a bed of green leaves. Where there are children, jellies and custards are a great standby, and if made in individual glasses occasionally will please. If whipped cream is piled on the glass of jelly it will be an extra treat. Another simple dessert is to make a 'blanc mange' and serve cold with jam or whipped or plain cream. Stewed mulberries and blanc mange with cream is also tasty. *Cake Trifle*—Use any plain stale cake, cut into pieces, spread with jam, and, if available, dip it in fruit juice. Place cake in a deep glass dish, and pour a custard, while still hot, over the cake. Set nice and cold and sprinkle top with dessicated cocoanut and serve with cream. *Lemon Sago*—One cup of sago, 2 lemons, 1½ cups sugar, 4 cups water, 2 tablespoons golden syrup or treacle, and a little essence of lemon. Put sugar, sago, and treacle to soak in water for one hour, add grated rind of lemons, and boil until clear and thick. Add the juice of lemons and let stand until cold in wet mould. Serve with cream, jelly, or stewed fruit. *Bananas and Custard*—Peel and scrape some bananas, cut them into small pieces, sprinkle well with castor sugar; squeeze some lemon juice over them and cover with a rich, cold custard. *Banana Fool*—Split the bananas lengthwise, spread with strawberry or raspberry jam; put the pieces together again, place in a glass dish, and cover with cold custard. *Dainty Apple Dish*—Peel and core apples. Make syrup of sugar and water, adding a little ginger. Put on whole, taking care they do not touch each other, and stew gently until tender. Lift them out with egg slice on flat dish until cool, then remove to glass or silver dish and fill each one in centre with whipped cream. *Apple Sago Mould*—Soak 4ozs. washed sago in 1½ pints cold water, simmer gently until thick and transparent. Stew 1lb. sliced apples, with the rind and juice of a lemon, to a pulp, add sugar to taste. Mix apple and sago, pour into a wet mould; when firm, turn out and serve with custard or blanc mange. Fruit sago moulds are made in the same way as above, using any kind of fruit and omitting the lemon. With juicy fruits less water is required. *Fruit Snow*—Take a large packet of strawberry or raspberry jelly crystals, 1 pint water, and 1 pint milk. Melt crystals in milk and water according to directions given on packet. Pour liquor into a large basin and put aside until cool, but not set. Whisk it with an egg beater to the consistency of thick cream. Serve in a deep dish, having a similar dish of fruit to be eaten with the snow.

WASLEYS.

November 3rd.—Present 62 members and visitors.

Mesdames F. Sanders and E. C. George gave reports on the Annual Congress, and the meeting then took the form of a flower show. Four prizes were given for various sections, and there was a very fine collection of flowers. Mr. Gwynne, of Gawler, acted as judge and awarded prizes as follows:—Best collection of six roses, Miss E. Fagg; best collection of mixed flowers, Miss E. Fagg; best bowl of flowers, Miss Vera Currie; best posey, Mrs. E. W. Day. (Secretary, Miss G. George).

WILLIAMSTOWN (Average annual rainfall, 27.71in.).

September 7th.—Present: 10 members.

USEFUL HOUSEHOLD HINTS.—The following were given by Miss W. Cundy:—"To cool lemonade, jellies, or blanc manges, stand them in a bowl of very cold water to which has been added a handful of common salt and some ordinary blue, such as is used in the laundry. Stand the bowl in a cool, draughty place and this will prove a good substitute for ice. Beef or mutton dripping can be used as a substitute for butter for cakes. Clarify it first by putting it in a jar and pour boiling water over it. When cold, pour off the water and scrape the underside of the dripping, on which small particles of foreign matter have settled. When required for cooking, beat up with a pinch of carbonate of soda and mix with the other ingredients in the ordinary way. Baked custards eaten either hot or cold with stewed fruit are a favorite sweet on warm days. A difficulty with custards is that they often curdle and become watery. This can be prevented by adding a few grains of rice when the dish is put in the oven. *Uses of Soap.*—If there is a slight smell of gas from a fitting or pipe, plaster on wet soap immediately. This will stop the escape until the gasfitter can repair the leak. To prevent the boiler rusting, as soon as the water is emptied out on washing day, and while it is still hot, rub on a generous coating of soap. This prevents rust, and the soap will start a good lather next washing day. A small mouse hole in the skirting board or cupboard can be blocked up with soap. If a 'ladder' suddenly appears in a silk stocking, rub some moist soap on it at once, but mend it before the stocking is washed. A few cloves boiled with corned beef improves the flavor." (Secretary, Mrs. A. Cundy.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Rendelsham ...	6/10/32	12	Address—F. C. Richards.	Miss B. White
Kangarilla	20/10/32	6	Congress Report	Mrs. M. Steer
Warramboo ...	12/8/32	8	Discussion	Mrs. A. Collins
Saddleworth ...	28/8/32	9	Papers—Mrs. Roberts and Miss Dawson	Miss G. Frost
Parilla	17/8/32	21	Annual Meeting	Mrs. R. Welden
Parilla	23/9/32	15	Discussion	Mrs. R. Welden
Parilla	23/10/32	15	Congress Reports	Mrs. R. Welden
Warramboo ...	7/10/32	15	Congress Reports	Mrs. A. Collins
Gladstone	8/11/32	32 and 30 visitors	Address—Miss E. Campbell	Miss M. Sargent
Millicent	30/9/32	—	Social Afternoon	Mrs. W. Varcoe
Millicent	21/10/32	11	Demonstration—Miss R. Yates	Mrs. W. Varcoe
Millicent	4/11/32	11	Discussion	Mrs. W. Varcoe
Clare	5/11/32	25	Visit to Local Hospital ..	Mrs. A. Rogers
Rendelsham ...	2/11/32	12	Christmas Gifts	Miss B. White
Belalie	8/11/32	19	Christmas Gifts	Mrs. A. Cummings
McLaren Flat .	3/11/32	18	Raffia Work—Miss M. Litchfield	Mrs. H. Robertson
Wasleys	13/10/32	—	Address—Messrs. Taylor and Cundy	Miss G. George
Wasleys	20/10/32	150	Annual Social	Miss G. George
Kangarilla	17/11/32	11 and 7 visitors	Social	Mrs. M. Steer
Pygery	15/10/32	10	Inaugural Meeting	Miss I. Heylen

SOUTH-EASTERN.

FRANCES (Average annual rainfall, 19.99in.).

September 14th.—Present: 11 members.

Mr. C. Koch read the following paper, "My Experience of Tractor Farming":—"In this article I have given my experience of tractor farming—growing grain crops, chiefly wheat and oats. The class of land I have been farming is what is known as crab-holey land with a fair percentage of it under black grass. The first job to be done towards producing a crop is the fallowing of the land, and to do this I have a 15/30 h.p. kerosene tractor as the powerunit. The plough is a four-furrow stump-jump. The banks as well as the crab holes become very soft, and a four-furrow plough is quite big enough for ploughing. Another point in its favor is that it does not miss ploughing very much land as is the case with a larger plough when passing over a crab hole or going up on to a steep bank. When fallowing, the plough is hitched to the tractor as close as possible, it pulls easier, and when one gets bogged, which often happens when the ground is very wet, it is a simple matter to put a longer chain on, move the tractor out of the bog on to firmer ground, and pull the plough through. To stop, hook a longer chain on, pull out, and back up to plough again occupies about three to five minutes. If there was someone who could patent a grip that would work on the wheels in this country and also the wheels made wider on the tractor, being bogged whilst ploughing would be reduced to practically nil. Three inches is the right depth to plough this country, but when breaking up crab-holey land for the first time, it is impossible to average out that depth all the time. Since 1929 I have ploughed about 800 acres of new land which has cost 4s. 6d. for kerosene and 6d. for oil per acre. With a four-furrow plough one acre per hour can be ploughed. The next job is working the fallow. The right time for that is towards the end of September, and can be done with either a set of heavy harrows or a light cultivator. Due to the very uneven nature of the country the working of the fallow in summer will ultimately prove the best plan, even though summer working has a tendency to encourage take-all. The implement that I use for the first working of the fallow is a 7ft. disc sundercut. This is worked to a depth of 3in.; on banks it goes in deeper, but in the hollows and flint-like places it does well if it cultivates 2in. in depth. This class of working is only done on new land and in summer; old land is worked in September with harrows or combine, and when worked in spring, it does not require to be touched again until it is put under crop. Too many workings on this kind of land tend to pulverise it too much, and when rain comes it sets down too hard. With the sundercut, 2¼ acres can be done in an hour, which is equal to about 22 acres a day, at a cost of 1s. 6d. for kerosene and 2d. for oil. It will be seen, then, that 100 acres per week is quite easily done when the machine is drawn with a tractor. The levelling of the land is the next operation, and this is generally done immediately after the sundercut has been over it, so the work will be completed before any rain falls and causes it to set down again. It is not possible to work the leveller economically and successfully whilst the fallow is wet. The levelling of the crab-holey land improves it a 100 per cent. in appearance, it makes it 50 per cent. easier to work on future occasions, and goes a long way towards helping to keep it dryer. The leveller I use is one made on the farm, comprising three railroad irons each 11ft. in length, spaced about 6ft. apart, with three pieces of round bull oak, with necessary stays to keep it square. Along each rail is a slab of wood about 1ft. in height to hold the earth that it collects passing over the banks, and due to the length of the machine it leaves the earth in the hollows as it meets with them. With this leveller 30 acres are done in a day at a cost of 1s. for kerosene and 2d. for oil. The planting of the seed and super is done with a 33-tine cultivator. The most suitable time to put in the crop is just after there has been 1½in. of rain, and if it falls at the beginning of May it is the most ideal time to have it; it gives one time to get in the crop and allow the seed to germinate before the cold, wet weather sets in. Always try and get in the crop before the crab holes are filled with water. I can, with the assistance of another man, sow 30 acres a day—one man to drive the tractor, the other to operate the combine. When filling the super and grain boxes valuable time is saved with two men, because the boxes can be filled in a minimum of time, and in this sticky soil of this district there is a lot of time spent in cleaning the grain and super hoes, which keep continually choking up with mud. With a tractor this trouble does not delay the seeding operations one fraction of time, because the man on the combine can clean the hoes whilst the machine is in motion. Do not sow the seed deep, especially on the crab banks; where the machinery sowed the seed more than 2in. below the surface there is a danger of take-all. I sow on fallowed land 1¼bush. of wheat and 100lbs. of super per acre, and on stubble land 1½bush. of oats and 100lbs. of super. When sowing oats on stubble land I put the combine over it once if it is not too hard after there has been 2in. of rain, but should it be the hard, flat-like soil that one finds in different places, work the sundercut in March as soon after a stubble burn as possible, and then put the combine over it after the first rain. The cost per acre is 1s. 6d. for kerosene and 2d. for oil. The next and last operation is harvest. This I do with an 8ft. harvester, and it also requires two men to work the tractor and harvester. On an average day, 18 acres are taken off in crops yielding about four to five bags per acre, costing 1s. 6d. for kerosene and 2d. for oil. Any hay that is cut is done with a horse team. The next and most important part of tractor farming is the care of the tractor. The tractor will not go successfully and efficiently unless it has care from the operator; do not abuse it. Care has to be taken when refuelling; do not allow foreign matter get in with fuel. See that the water system is attended to; do not let the water get too low. Keep oil level up in gears, see that the right grade of oil goes into the crank case, and drain the crank case when the oil loses its strength. Do not work the tractor if it does not sound to be running right. Periodically, the valves have to be ground in and the bearings taken up if there is any slackness in them. When fallowing in winter, the wheel bearings should be looked over every week. If these points are observed, the owner of that tractor will be well satisfied, because for getting over a large area of ground in a short time a tractor is unbeatable. No one unless mechanically inclined should think of purchasing a tractor, because it will not go long without attention and care. Below is the total cost of fuel, oil, and wear and tear per acre during the working of my tractor whilst farming:—Fallowing, 4s. 6d. for kerosene, 6d. for oil per acre; cultivation, 1s. 6d. for kerosene, 2d. for oil; levelling, 1s. for kerosene, 2d. for oil; sowing, 1s. 6d. for kerosene, 2d. for oil; harvesting, 1s. 6d. for kerosene, 2d. for oil; wear and tear, 2s. per acre; total, 13s. 2d. per acre.'' (Secretary, E. Pfitzner.)

SANDALWOOD (Average annual rainfall, 13.57in.).

September 9th.—Present: Six members.

Mr. D. Masters read a paper, ''The Number of Horses required to work a 1,500 acres Farm in the Mallee east of the Murray'':—''To work a farm of this size I consider that a team of 12 workers with one useful animal for spring cart and as a hack would be necessary. The main point is to utilise as near as possible all the horses, and to save feeding spare horses. I advocate a 20-hoe combine, or, if preferred, a 17-tine cultivator. The combine could be worked with 10 horses, with two for harrowing and carting out manure and seed. The cultivator would require eight horses, and a 17-hoe drill four horses. Either four or eight leaves of harrows could be worked. Two men could seed 500 acres. The fallowing of 500 acres could be done with 10 horses and a 10-furrow plough of not too heavy a type, leaving 500 acres for feed, portion of which could be sown with oats for grain and feed. The two spare horses could be used for carting stumps off the crop and fallow and harrowing the fallow. The harvest could be taken off with two 8ft. reapers with 10 horses, with two horses in reserve, or one 10ft. harvester, with, say, seven or eight horses, and one 8ft. reaper, the spring cart horse being available if required. The wheat could be carted with eight or 10 horses, and the rest could cart in the wheat chaff. The smallest amount of hay to be cut for feed would be 60 tons; allowing a ton of hay to last a horse for eight weeks, the 60 tons would last 40 weeks, leaving 12 weeks for paddock feed or wheat chaff and oats.'' (Secretary, W. Cairns.)

TANTANOOLA.

October 29th.—Present: 10 members.

Sore Shoulders on Horses.—Mr. J. Carthew, who has been a teamster for many years, read the following paper:—''Every good horsemaster takes an interest in the condition of his team. Naturally, he will not tolerate sore shoulders, though to avoid slight sores at all times may be difficult and perhaps impossible. In a team of horses that are well cared for, one will seldom find sore shoulders. With a team in poor condition, coats sticking up like the prickles of a porcupine, and the harness curling up from being over dried in the sun, and other indications of negligence investigation will invariably reveal sore shoulders. The two cases cited rely on the following two reasons: The man in charge of the first mentioned team, being careful about condition of horses, harness, and other details, will naturally be equally attentive to sores and cure them before they become stubborn. But the owner of the neglected team pays no attention to the welfare of the animals, and the painful results will very often be found under the collar. The beginning of winter is a bad time for the shoulders of working horses, owing to the fact that their coats get heavy and perspiration is increased, and as horses have to work until nearly sunset, the collars keep damp. The fact that horses brought in fresh and put to work will very easily scald is another cause of the trouble. The sagging of chains in swingletree work will cause sores on some horses. Also the use of pole straps sometimes brings about trouble, the collar is held too firmly to the pole and chafes the shoulder. Keep the collars as dry as possible by hanging them up in a draught over night and dry as much as possible during the week end. Keep them clean and frequently soften the stuffing, using a bottle or smooth hammer to hit the collar. Strike from the outside, driving the stuffing towards where the collar touches the horse's neck. This will soften the collar and improve the shape. Collars doing heavy work always seem to push outward and flatten where the most contact comes, while the shape should be slightly converse. When working in swingletrees, the use of a back band will ease the tendency for the sagging of chains, and, when in leading harness, have a strong belly band, so that it will stand tightening to an extent that will make the draught slightly down, thereby bringing the pressure evenly balanced on the shoulder. When first working horses that have been spelling, wash the shoulders at midday and night while still warm from work, and if a horse is thin skinned and threatens to break, repeat the washing. A horse that has to do hard work should be kept in hard condition. Back bands, belly bands, and collar stuffing are important, but the teamster cannot afford to neglect good fodder for the horses. *Remedies for Shoulders that have broken open from Chafe, Scald, or Bruises*—Wash the wound immediately on ceasing work sufficiently to thoroughly cleanse the sore part. In the morning before harnessing, repeat the washing, leaving a good lather of soap on the shoulder; this has a cleansing and soothing effect, and after a few days the scar will start to heal. Be sure that the collar is not projecting on the wound; if so, it requires easing. Horses with very bad shoulders have been cured by washing at the trough dinner time and night with water only, but the use of soap is an improvement. Gall cure is very good for small wounds on the shoulders and back. It should be applied regularly each day before and after work. Keep the collar scraped clean when using gall cure, but do not use any water on the wound with this remedy. A false collar reduces friction and is good for a thin skinned horse that is chafing. It is claimed that a tanned sheep skin makes an excellent false collar; this prevents the stuffing from absorbing perspiration, besides preventing chafing, providing that it is kept soft and pliable. As horses have to be given a drink at dinner time and evening, there is no inconvenience in having to dip out a bowl of water and wash shoulders with a cloth with water from the trough. In some instances shoulder trouble is due to the horse being too 'free' for the rest of the team. In such a case, it is a good plan to lengthen the chains sufficiently to steady this horse when he is in front; the couplings have a check on him and generally he will settle down to steady work. Experience proves that the remedies mentioned in this article effect a more permanent cure if the horse is kept at work, and for this reason I am opposed to spelling the horse, which will generally break out in the shoulders when put to work again.'' (Secretary, H. Kennedy.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Mt. Gambier ...	14/10/32	11	Congress Reports	G. Gully
Penola	14/10/32	8	Congress Reports	F. Hinze
Mundalla	14/11/32	60	Gas Producer Tractor Demonstration	A. Ross
Coonawarra ...	27/10/32	14	Congress Reports	J. Kain

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

APPILA (Average annual rainfall, 14.69in.).

October 7th.

Question Box.—''A set screw head broken off level with bearing; how can the rest of set screw be removed?'' *Answer*: Drill a hole in the set screw and then drive in a square punch and thus it can be turned out if not too tight. ''Prevention and cure for sore shoulders in horses?'' *Answer*: Keep shoulders clean, work steadily for the first few days after a spell. If a shoulder is sore, sew in the lining of collar by cross stitching just over the seat of the sore, thus no pressure will be on the sore. For an ointment, lard and kerosene mixed is quite beneficial. ''Is it better to leave the fallow rough and rigid or smooth during smmer?'' *Answer*: This depends on the nature of the soil and the lay of the land. In using hilly country it is advisable to leave the fallow rough. ''How can the small black ants be prevented from climbing up fig-trees?'' *Answer*: One member advised tying a piece of sheepskin around the trunk of tree. (Secretary, E. Wurst.)

November 8th.—Present: Nine members.

Hay Making.—Paper read by Mr. C. Wurst:—''If any wheats are particularly sown for hay it is a good plan to sow early hay wheats. King's White, Sultan, and Gluyas are considered about the three best varieties. King's White and oats mixed makes very good hay. It is also advisable to sow early wheats around fences or where tracks are likely to be cut. The sowing of early wheats enables one to cut the black oats at the right stage, thereby helping to clean the land of that weed, and gives time to get the hay cut and carted before the main wheat crop is ripe. Hay should be cut when the grain is between the milky and the doughy stage. *Cutting*—Before commencing to cut, see that the binder is in good working order. In cutting tracks, the simplest method is to cut the back cut first, which only makes it necessary to shift one sheaf carrier load at each row. *Stooking*—Stooking should be done as soon as possible after the binder. The stooks should be three or four sheaves wide, thereby making the stook long in the same direction as the rows of sheaves are, again making it easier for the stooker. The sheaves should be placed against the stook with the knots out and fairly erect. By making long stooks the hay will dry out better, it will not mould so easily, especially if rain falls. It also is worth while for the man stooking to carry a small bundle of twine on his belt to tie the loose sheaves. *Cutting and Stacking*—Hay should never be carted until thoroughly dry. The time of drying varies according to the weather conditions, approximately from nine days to a fortnight. If the hay is too damp to cart after a rain, the addition of a little salt makes it quite safe. I prefer the stack with square ends. Seven yards should be wide enough for the average-sized farm. When starting a stack, the crown should be raised immediately to about 2ft. 6in. to 3ft. higher than the outside. This crown should be kept all the way as the stack goes up. The outside row of sheaves should be placed with the knots of the string down, and the backing up sheaves should have the knots up, lapping the sheaves with the heads out. It makes the stack better to walk on if the sheaves are all placed with the same side up and helps to prevent 'burrows.' By laying the outside sheaves well on the high edge it allows the stacker to lap the backing up sheaves more than would be the case if the edge sheaves were placed flatter. When starting a layer, the best method is to start at one corner and build right to the next one and again starting on that one on to the next; in this way the corners will be doubled. It is bad practice to make a joint of the outside row 5ft. or 6ft. from the corners, especially if the joint is always made at about the same place; this is likely to let the corners slip. It is a good plan to put one layer on in one direction and every alternate one in the opposite direction. A stack built in this way is not nearly so likely to 'walk.' I do not favor a high post in each corner as a guide, because the builder has a tendency to build right up against the guide. Keep the corners in a trifle when building, because they naturally tend to slip out a little as the stack goes up. A good practice when stacking is to walk as close as possible to the edge and corners on every layer; this keeps the sheaves firmer and helps to prevent slipping. When the stack is completed, cover it with a good coat of straw, which should be well tied down.'' (Secretary, E. Wurst.)

EURELIA (Average annual rainfall, 12.87in.).

August 27th.—Present: 12 members.

HORSES *v.* TRACTORS.—The following paper was read by Mr. W. Shepherd:—''In wet weather horses have the advantage when working against the tractor. The tractor user always has a cultivator working behind the tractor instead of a plough for fallowing and very seldom is the land worked over a second time, because the cost is too heavy. In seeding the horse team sows close to the fences and creeks, and this is cut for hay, whereas with a tractor the land is either left idle, or if sown, the crop is knocked down while reaping. In harvesting the crop horses also have the advantage, because there is not as much machinery to depreciate in value, and further there is not the danger. The horse team is able to cart the wheat and super and other necessaries without the farmer paying for this work. By rearing a foal or two a year it is possible to replace any which are lost or too old for work. With a tractor it means cash to keep it in repair and fuel.'' Mr. J. Kildea read a paper on ''The Advantages of the Tractor.'' (Secretary, E. Wall.)

WARCOWIE (Average annual rainfall, 11.42in.).

November 8th.—Present: 14 members.

Mr. W. A. Crossman read the following paper on ''The best Way to Deal with the Pests of Australia'':—''There are three pests which are the most troublesome to the man trying to grow wheat in the Far North. The one that does most damage when it does come is the grasshopper. The following birds—white cockatoo, galah, ringneck parrot, sparrows, &c.—also do a good deal of damage to the outback farmer. Some people do not consider those birds as destructive as they really are, but they are the worst pests to deal with, both winter and summer. They eat the wheat as it is sown, especially broadcast sowing, but one can do something to keep them in check by sowing a few extra bushels of strychnine-treated wheat. The rabbit is the other serious pest, and large sums of money are spent in various ways trying to keep them under control. The drought is the quickest and easiest way of thinning them out, but even that does not exhaust them entirely. The poison cart kept going will reduce the numbers as well as any method, and when they refuse poison traps can be used. If everyone did this it would not be so hard on the few farmers that are trying to get rid of them. Otherwise, even netting fences are not the means of keeping rabbits from getting in and eating what feed one has been trying to save. The small rabbits continually keep getting through the meshes and it is impossible to entirely clear them out.''

Mr. V. Sanders read the following paper on ''Harvesting Operations'' written by Mr. C. Sanders:—''The first care in harvesting operations is to overhaul the strippers and harvesters. See that all bolts and nuts are tightened and replace badly worn parts and bearings. All harness, swings, and chains must be in good order, and enough oil and kerosene on hand to finish harvest, so that there will be no delay while the work is in progress. If a stripper is used, always keep the wheat heap well thrown up; if this is not done it is likely to cause damage to the wheat. Days that are not suitable for reaping can be occupied by cleaning the wheat. I prefer the stripper for saving the chaff, and for a man with plenty of labor, but the harvester is best for a man that cannot afford to pay too much for the harvest and for the tractor owner.'' (Secretary, A. Crossman.)

WILMINGTON (Average annual rainfall, 17.50in.).

September 20th.—Present: 17 members.

HANDLING BRUMBIES.—Mr. J. Modystach read the following paper:—''First construct a good stock-yard and also a crush-pen. When in the pen, rub the colt all over, especially the head and eyes. A pair of winkers can then be put on without a great deal of trouble. Next fasten on a pair of hobbles, take the horse out in a large yard and run it around for 10 minutes; then take off the hobbles and thoroughly mouth on both the near and off side with a pair of reins. On no account should a whip be used while this is done. Again put on the hobbles and then a collar, hames, and leading harness, and run the colt around in hobbles for a little while until the animal is under control. Remove the hobbles and drive him around, and the colt should be ready to put in the team, either abreast or tandem.'' (Secretary, C. Cole.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Morchard	1/11/32	17	Address—E. L. Orchard..	A. McCallum

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Beetaloo Valley	13/10/32	9	Address—E. L. Orchard .	B. Giddings
Beetaloo Valley	18/10/32	—	Tour of District	B. Giddings
Beetaloo Valley	7/11/32	12	Paper from *Journal*	B. Giddings
Redhill	25/10/32	12	Congress Reports	S. Pengilly

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

GREENOCK (Average annual rainfall, 21.60in.).

October 17th.—Present: 38 members.

EXTERMINATION OF PESTS.—Following the reading of a paper on this subject by Mr. E. Helbig it was thought that the starling did more good than harm. The fruitgrower and vine-grower being the only sufferer, and the little fruiit the starling took did not justify its wholesale destruction. To destroy rats one member found the following a good remedy: Put out some wine in a saucer one or two nights and then add strychnine or arsenic. Lice on cattle and horses could be treated effectively with a rag dipped in kerosene. An old bag dipped in any oil and tied round a post helped pigs to rid themselves of tick by rubbing on the bag; or a hole filled with water and oil in the pig yard, was found helpful. For the destruction of snails lime was recommended. To control mosquitoes kerosene on the tank water was advised. (Secretary, A. Schubert.)

LIGHT'S PASS.

September 19th.—Present: 28 members.

MAKING SMALL GOODS.—Mr. N. Kruger read the following paper:—''After sticking the pig have a billycan close handy in which to catch the blood. The best method of treating the blood is to stir it fairly fast to prevent it from thickening. The blood should be set by the time the pig is dead. On no account add any water to the blood, or it will spoil the keeping qualities of the black puddings. The blood should be put away in a cool place with a thin cover over it. *Black and White Puddings*: After dressing the pig clean the head by scraping off the hair and removing the eyes, nose and ears. Then take out the tongue and brains. Next cook the giblets, also a neck of beef. Special attention should be given to this operation. The best way to see if the meat is done is to insert a fork into it. Care should be taken not to cook the liver too long or it will be tough. As soon as it is done take it out of the copper and put it into the dish and keep it covered. The beef needs a little longer cooking than the rest, but care must be taken not to get it too tender. When cool, use the beef, small portion of the head, the lights, tongue, heart, lung, and kidneys for black pudding. After the bones have been removed about 2lbs. of rice is boiled tender and dry and added to the meat. The meat is then minced and the seasoning added, salt, pepper, pimento, marjoram, and thyme. The blood is then strained and thoroughly mixed. Most of the head and all the liver are ground up together with one loaf of bread and one small onion for white pudding, the seasoning being the same as black pudding. The next operation is the filling. The sausages are filled into casings which can be obtained from the local butcher. The mixture is filled into a barrel filler with a funnel for it to come through when forced. To prevent air pockets the ground meat is pressed in tightly; the casing is pulled over the nozzle of the funnel. The sausages are tied tightly and are ready for cooking. This is done in the same water in which the meat was boiled, and occupies about 20 minutes. After taking out, lay them on white paper to cool. When cool hang on a stick so that they do not touch one another. *Metwurst*: The meat is taken from the ribs of the pig, only the lean is used. To 30lbs. of pork add 15lbs. of beef—silver side. Mince it up and add the following ingredients:—10ozs. salt, 4ozs. pepper, 2ozs. saltpetre, ¼ cup of sugar. Mix together and fill into casings. After being filled hang for a day to dry and then put into the smoke house until brown, when they will be ready for use. *Fry Sausages*: Cut up about 30lbs. of meat and 2½ loaves of bread small enough to go into the sausage machine. This meat consists chiefly of beef and scraps, cheek flap, flank beef, flap mutton, and scraps of pork. After it has been ground up, salt, pepper, and thyme are added for seasoning, and about 3 pints of water, below 50 degrees, so as to make it easy to mix well together. Fill into casings, twist, and hang out to dry. *Fritz*: Cut up about 50lbs. of beef and remove as much fat as possible. To this add about 10lbs. of pickled pork. Weigh about ¾lb. salt, 4ozs. pepper, 3ozs. saltpetre, ½ cup of sugar, and mix well together. Mince and mix again; then let stand over night; next morning mix again. Fill as tightly as possible into casings and hang in a shady place for about 1½ hours to dry. Then place in the smoke house and smoke for about 8 hours or more. After being smoked hang on a wire and cook in water for 2 hours, the water being hot enough to bear your hand in it. Finally take out, cool, and dry. *Garlic Sausage*: Cut up 40lbs. of beef, and mince. Add ½lb. salt, 3ozs. pepper, 2ozs. saltpetre, 4ozs. garlic, and ¼ cup of sugar; thoroughly mix, fill into casings, and smoke for about 10 hours. Remove from smoke house and hang out to cool.'' (Secretary, C. Verrall.)

October 10th.—Present: 36 members.

AGRICULTURAL SCIENCE.—Mr. S. Beech read the following paper:—''The development of this subject is an interesting study. Towards the end of the eighteenth century, the increased demand for foodstuffs from the industrial areas of England turned the farmer's thoughts towards more production from their land. Lord Townshend—a Minister of King George—introduced root crops from Germany, and following that came the rotation of crops and subsequent improvement of tillage. Jethro Tull brought in the use of the drill and inter-cultivation. Bakewell developed the Leicester breed of sheep, and the Smithfield Club of stock breeders was formed. A wave of new thought swept the country, and here began the first ideas of the science. The accumulation of stable dung from the stall-fed cattle was spread over the fields, and the mixing of soils commenced. With the advance of chemistry and physics reasons began to appear for these practices, and by the nineteenth century a definite plan on scientific farming was evolved. Great advances have been made since then, for while costly experiments had then to be made, we now can analyse the soil and know exactly what to supply and what crop to grow. The growth of the manufacture of commercial fertilisers shows to what extent the science has progressed. This science is a clear knowledge of the factors that cause the growth of plants and animals, and the chemical and physical properties of the soil that affect farming. The whole aim is to produce the greatest return of quality produce from the land at the lowest possible cost. *The Progress of the Science in South Australia*: In primary schools there has been taught for some years elementary agriculture to give the younger children some idea of farm operations and the reasons for the same. Then the development of Agricultural High Schools followed. Roseworthy College and the Waite Research Institute provide for the advanced student and the research worker. A still further advance must come in the near future—that of Farm High Schools. These would be well equipped central schools in the geographical centre of closely populated agricultural districts. They would teach the ordinary high school subjects, but their chief subject would be agricultural science. They would not need much land, for the practical work would be done on the farms and orchards around. A good laboratory would be needed and a first class man in agriculture in charge. It would not only be a school, but the district centre for the agriculturist of the district. With the complete co-operation of father and son, latent possibilities of many districts would be set free. The farmer would bring his problems to the school to be solved, and much of the wasteful effort and loss of money would be avoided. The boys would combine their theory with practice on their fathers' land, and the newest ideas of science would be brought daily to the farm. The school would welcome problems of disease of stock or plants. Diseases would be controlled and improved methods would double the production. The cost of the school would be repaid many times in a few years by the service to the community. The subject itself deals with the chemical and physical properties of the soil, the science of botany as it affects farming, a knowledge of agricultural chemistry, the general ideas of geography as to climate, formation of land masses, and influence of climatic conditions, the uses of commercial manures, and the practice of modern farming, the production of new types of plant, the destruction of plant enemies, and the knowledge of various sprays and methods of making and applying, the study of injurious insects and fungi, and other subjects important to the cultivator. The testing and judging of all kinds of farm stock is very important, and forms an important part of the subject. Schools taking this subject are essential to the community. They have been in operation in Holland and Denmark for many years, and have saved both those countries from bankruptcy by increasing their export of produce.'' (Secretary, C. Verrall.)

OWEN.

September 19th.—Present: 11 members.

The meeting took the form of a ''Question Box.'' ''Which harvester is the most suitable for this distrct—the beater or knife machine?'' Mr. J. McPharlin introduced the question, he being in favor of the beater machine. A keen discussion followed, but members whose farms are situated in sandy soil south of Owen were in favor of the beater type. Farmers working the heavy black soil favored the knife machine. It was thought that where two machines were kept, one of each would be advisable, because there was always a crop the harvester could reap, and this machine had the advantage of less working parts. *Wild Turnip*—It was reported that this weed had completely overrun the station yard. It was extremely difficult to eradicate when once it became thick because it had to be hand pulled. Farmers kept their land free from it, but as it flowered and seeded on the railway property it was continually spreading.

On October 11th Mr. S. Lacey read a paper from the *Journal of Agriculture*. Fourteen members were present.

A report of a visit to the Roseworthy Agricultural College by 30 members of the Branch on October 24th was given by Mr. McPharlin. (Secretary, M. Freebairn.)

PENWORTHAM.

October 13th.—Present: Nine members.

PLANTING, CARE, AND TREATMENT OF YOUNG CURRANT AND GRAPE VINES.—The Hon. Secretary (Mr. A. Jenner) contributed the following paper:—''*Raising Cuttings*—This can only be done successfully where a water supply is available. Select cuttings from canes of fruit spur wood and be careful to discard water shoots and unripe wood. Cut all sticks from the base of cane, discarding the tops; these cuttings should be at least 1ft. in length or longer and have at least four to six buds. Carefully tie the sticks in bundles and place in a moist situation; if in the open, cover with hessian until planting time, about mid-September or early October. By the time they shoot the frosty period will have passed. The methods of setting canes are as follows:—Spade or plough. If a spade is the only tool available, dig about 14in. deep, then place the line on top drawn tight as a fiddle string, and press the canes into the loose soil up to the third bud. This leaves one bud above ground, one at ground level, and two below ground. After completing the row tramp securely to make all airtight; then cover tramped ground with 2in. or 3in. of loose soil or mulch, spacing the rows about 2ft. apart and the cuttings 1in. to 2in. apart. It will be necessary to give considerable attention to the bed by watering, hoeing, and mulching. If it is not possible to raise the vines, purchase them from a reliable nursery. Having provided for next year's planting by raising the vines, it is assumed that the land intended for planting is cleared, fallowed, and worked well during the year. Plough deep and well, and subsoil if it can be afforded. Planting the young vines should be done in July or early August, although many successful plants have been carried out in September, showing a 90 per cent. take. The only ground that should be planted late in the season is low or frosty ground. Many methods of planting are in use, but I prefer line planting. First square the ground, allowing 18ft. or 20ft. headlands. If it is desired to have the rows run parallel with one particular fence, it is only necessary to measure the required distance in three or four places and set up a line of sight sticks, squaring off from the corners by use of the builders' method of 6ft., 8ft., 10ft. For currant vines I prefer a 10ft. x 10ft. plant, grape vines 9ft. x 9ft., for bush spurred 10ft. x 9ft., for rod and spur trellis. Nothing is to be gained by crowding a large number of vines on an acre, the wider the plant, the more feeding and moisture space available for each vine. With line planting it is only necessary to peg the back or headland line and side line—the stakes to be cut and ready on the ground. Set up the line at the required row spacing, then place a stake at each notch, free one end and throw the line back out of the way. Sink holes, and replace the line for planting. Plant all vines to the notch on the line, and at the back of same, and stake. This leaves the line free to be moved to the next row. This method saves much that would otherwise be taken up in sighting or squaring. When sinking the holes, do not have them less than 1ft. x 1ft. square and 1ft. 3in. deep, the bottom to be well barred up; plant as deep as the length of the vine will allow. Take care to measure carefully and work the line true. If crossing a sharp dip a weight to hang on the centre of the line may be necessary. When planting, mound the bottom of the hole with freshly broken top soil, spread out the trimmed roots, and cover same with finely chopped and broken top soil, using the hand to cover and press the first layer over the roots. Afterwards fill three parts full of earth and tramp well. The top should then be filled with loose earth and left a little higher than the surrounding ground to allow for sinking. After it has been hoed once it will be level. Having planted the vines at the earliest opportunity, cultivate and cross cultivate at regular intervals. Keep the hoe busy and cultivate after every rain. Prune to one bud on the strongest shoot and stake after ploughing has been completed. The stakes should be pointed at the butt end, be driven well into the ground, and long enough to be at least 2ft. above where it is intended to run the trellis wire. Select and tie the climbing shoot to the stake and cut off all surplus shoots from time to time. Use the cultivator and hoe freely; the two first years are very important in getting the vines set and started. At the trellising period the grower has to make his choice of system, but whatever system is decided upon, it must be adhered to. When finished, tie the stakes to the wire, prune the cane, and twist on wire about 15in., but even a very strong cane should not exceed 18in. the first year. When the young vines shoot, disbud from the bend on the wire to ground level. If this is done carefully a considerable amount of trouble will be saved during the growing period of the first year on the wire. As soon as possible tie out the leaders, but not too tight; allow sufficient space for the swell of a vigorous cane. Cultivation this year should also be good; neglect in the early stages often results in stagnation, the vines become stunted, and once this happens it is not an easy matter to rectify. When pruning the next year, cut out all last year's tie strings and replace with fresh ties in a different place. Space the spurs about 6in. apart, one on either side of the wire, and leave at least 6in. of clearance at the bend. Cincturing will be necessary on vines of this age. Use the knife, because the vines are not strong enough for saws. During the two following pruning seasons, as the vine stumps and arms become strong enough, untwist from the trellis wire. This is a job that will require much patience, but once accomplished will prove worth while in future years. It will allow the trellis to be kept strained and in excellent condition. Also if one unfortunately strikes a vine with plough or dodger not quite so much damage will result to a free vine.''

STOCKPORT (Average annual rainfall, 16.80in.).

August 12th.—Present : 12 members.

DAIRYING AS A SIDELINE.—Mr. R. Koch read the following paper :—'' Most farmers are beginning to realise more and more that it is difficult to make a living entirely out of wheat growing unless they have purchased their farms at a fairly low rate per acre. Consequently they are turning to other avenues to increase their income ; and if properly managed, dairying is one of the most profitable side lines if we will consider a few of its points. On the average farm of between 300 and 400 acres six or more cows could be kept quite easily and also 100 ewes. In some cases more cows can be kept. This is largely dependent upon the manner in which the farm is cropped. The main thing is for the person to keep a good class of cow. The breed largely depends on a person's individual taste. I prefer the Jersey. Not only do they eat considerably less than most breeds, but they also give milk with a high butterfat content. If a farmer is in possession of a herd which is not pure-bred, he would be well advised to sell the lot, and to obtain several pure-bred cows or heifers and a pure-bred bull and breed his own herd. Cows of several breeds under one hide are often successful in themselves, but oft times their heifer calves are failures. It is preferable to stick to one breed, only one bull is then needed. *Feed* :—It is advisable to sow from fifteen to twenty acres of Cape barley or some other fodder with rapid growth, with the first rain in the season. This will give an early crop of feed before the clover and other grasses are tall enough for grazing. In summer, when there is very little greenfeed about, it is advisable to have a lucerne patch. Lucerne can be watered with most well-water in the district. It is well worth the trouble and expense of putting down a well and pumping plant to provide water for lucerne. If the farmer already has a well containing a good supply of water, he could easily convert the pumping equipment to pump enough water for all his needs. It is a good plan to sow a block of Sudan grass every spring even if it does not always turn out to be complete success. Cows need an abundant supply of clean drinking water in summer. When there is not sufficient greenfeed, cows should be handfed. A good quantity of chaff, oaten in preference, to which has been added a quantity of bran or linseed meal, should be used. In order to obtain first class butter it is necessary to take certain precautions. Thorough cleanliness should be observed in milking. Hairs and dust from the cow's body and udder contain germs which "turn" the cream. If the separator is washed only once a day, not only will the cream become stale,, but the bowl, milk and cream cans of the separator will become rusted and so shorten the life of same. It is best to allow the cream from the separator to run into a clean container and become cool before adding it to the bulk in the creamcan. Cream should not be used from a cow which is near calving or which has just calved. It is better to allow four or five days to elapse after calving than to get a second grade price for the butter. Cream should be kept in the dairy in hot weather. If this is not available, it is best to stand it under a cool verandah and to wrap several wet bags around the can. These should be moistened several times a day to keep them damp. This method of keeping cream cool is in some respects better than keeping it in a dairy, because there is better ventilation around the can. In order to get the most from the cows, it is essential that all the butter fat be taken from the milk, therefore, the separator should always be kept in first class condition. If the separator is faulty and leaves cream in the milk, a considerable portion of the profits will be lost. If parts of the separator become worn and rusted, they should be replaced immediately. If the machine would cost too much for repairs, buy a new one. A few shillings or a pound spent on the separator is money well spent. Milk should be separated immediately after milking, while it is still warm. If for some reason or other it has been allowed to stand until cold, it should be artificially warmed before putting through the separator. The separator should always be turned at the speed it was designed to be turned at. The correct adjustment of the cream screw is also essential. It is not advisable to try to get cream with too high a butterfat percentage. This will often result in the separator leaving some cream in the milk. If the butterfat percentage is too low, it will leave the cream in a condition in which it will easily turn stale. Thin cream is somewhat awkward to handle in cans. The butterfat test of the cream should be somewhere between 47 and 54 per cent. In milking, the cow should be stripped. Care should be taken not to jerk the teats, this injures the small glands in the udder and diminishes the milk flow. A gentle, fairly rapid action in milking is better than a slow jerky one. Cows should be milked at the same time each day. It should be seen to that the night period is not very much longer than the day period. The average milking cow needs about five to six weeks' spell between each milking period. The cow will not only give much more milk, but she will have a chance to strengthen her constitution which will make it more unlikely for her to contract milk fever or any other disease after calving. It also gives her a chance to develop a stronger calf. When a cow has been milked too long, she often has a weak or crippled calf which is due to the excessive mineral drain on her system. In rearing a calf to sell, it is better to let it run with the cow than to bucket feed it. It means less work and makes a better calf for the market in a shorter time at very little more cost. In the case of bucket feeding calves, it is necessary to add some artificial food, and it generally takes several weeks longer to bring a calf to the same condition as a calf that runs with a cow. When it is decided to rear a heifer calf, it should not be taken from the cow for the first week, because the milk then contains certain foods for the calf which it is quite impossible to add artificially. Make it your aim to improve the herd so that the quality of the butter is of such a high standard that it is fit for export overseas. This side-line, if gone into properly, will not only help the farmer out financially, but will also help materially in lifting the State out of depression."

THE HORSE ON THE FARM.—Paper read by Mr. D. Higgins :—The Clydesdale horse was first developed in north-west of Scotland. Owing to the natural conditions of this part of Scotland, these horses became known for their hardiness. It was a general practice amongst the Scottish breeders to keep their young stock in a semi-wild state, tending them the bare necessitous care until they were ready to be broken in. With their environment these horses developed into wiry stock. These horses are very intelligent, and as a draught horse in such respects they have no equal. *Good Points of the Clydesdale.*—It has a broad jaw, ending in a not very fine or well developed muzzle, but with large open nostrils. The eyes are full and vigorous, yet mild. The forehead is broad and full, especially between the eyes. The ears are long and active. The neck is strong and massive, and on top showing good development of muscle. The shoulders are oblique, allowing the horse to step out boldly and move to perfection. The forelegs are well placed back from the shoulder points and placed right under the body, a little obliquely towards the hind quarters. The knees are big and long. The feet are good and big, with widely developed hoofs of the best quality. The forelegs show a lot of muscle, with plenty of hair, denoting quality and strength. The body is short and barrel shaped, with well sprung ribs, the ribs going back to the hindquarters. This is generally considered the weakest point with the Clydesdale. They have broad loins, with broad low set quarter, witth muscular gaskins descending into a broad and evenly developed hock. The average height of the Clydesdale is 16.2 hands. The best color rich bay, with a white blaze and four white feet. *Feeding and watering the horse* :—The watering should come first. The water takes the undigested food away from the stomach. Eight gallons is an average drink for a horse, although horses have been known to drink twenty gallons. If a horse is hot, leave the bit in the horse's mouth. A horse should have four feeds a day. The horse should be given as much as it can eat. The bulk of feed should be given for the night period, because the horse does not sleep to any great extent. Late at night, a couple of sheaves of hay will keep a horse contented and will help to keep the teeth level. In the stable, every horse should have dry clean straw to rest on. Before taking out to work, the horse should be well groomed. The horse's collar is a very important part of the harness. Sores very soon appear under collar and girth if chafing and friction are allowed. To avoid this trouble, make quite sure that the collar fits well against the sides of the neck. If it has to be pressed on the shoulders it is too narrow. One should be able to run one's fingers flat up and down underneath the collar. Collars should rest, firmly but not too tightly, on both shoulders. There should be no seesaw motion. The top of the collar must not pinch the top of the neck. A young foal should be educated when three or four months old. It first should be tied up with a headstall and later on mouthed up. If this operation is not properly attended to at the start, trouble will be encountered later. The colt should be broken to light work at the age of two off, and it will generally be found that in a year's time it will be able to hold its own with any other in the team.''

Mr. W. C. Johnston (District Agricultural Instructor) spoke on ''Side Lines on the Farm.'' (Secretary, L. Klaffer.)

TRURO (Average annual rainfall, 20.02in.).

September 19th.—Present: 14 members.

WILL THE EXISTING SYSTEM OF MIXED FARMING SUFFICE TO IMPROVE THE COMMERCIAL AND ECONOMIC SITUATION OF THE PRESENT TIME?—Mr. H. Brown, of Alma, read the following paper:—''Primary product requirements, machinery, superphosphates, &c., are very highly priced and raise the actual costs of farming to a point where it does

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not pay, but we must carry on with hopes of better times to come. The existing economic conditions, high tariffs, high rate of exchange are crippling the industry. To send money out of Australia 25 per cent. has to be added to cover the exchange, or *e.g.*, £1,200 brought into Australia by woolbuyers, &c., is worth £1,500 here. Locally, wheat, wool, wine, dairying, dried fruits, lamb and pig raising are the chief lines for the primary producer to follow. I do not agree with the slogan of growing more wheat in the sense it implies by sowing more land. The practice should be to endeavor to grow 20bush. of wheat instead of 15bush. per acre, because it does not cost any more. Wheat seasons vary, therefore we cannot expect the same returns per acre every year. The three-course rotation of bare fallow-wheat-pasture is the best rotation for wheatgrowing. The fertility of the soil must be built up and maintained to the best advantage. Fallowing should be finished by the end of August, and worked down to a good mulch before summer, but this is controlled by weather conditions. Crops turning yellow during the growing period is sometimes attributed to excessive wet, but this is not always the reason; excessive cropping will cause a deficiency of nitrogen and a consequent yellowing. The remedy is to spell the ground or grow oats on it. Oats are good for checking diseases and tone up the land. Where clover is found growing the fertility of the soil is good, and a good wheat crop can be grown if the land is properly fallowed, because clover is a high producer of nitrogen. Get the soils on the farm analysed by the Department so that suitable fertilisers can be used. Some soils require more lime than others to give the best results. It is a mistake to grow wheat on stubble ground, because it is productive of disease; either sow with oats or feed off with sheep. The farmer requires 600 acres to raise sheep for wool, but it pays small landowners to raise lambs for export. The man with suitable country to raise wool should select a line of Merinos and stick to line breeding. The farmer with a smaller holding to raise export lambs requires 150 Merino ewes of big, plain body, short legs, and no wrinkles, to cross with Dorset Horn, Southdown, or Shropshire rams in order to produce the breed that will ship well. Science has proved these to come out of the freezers better than other breeds. *Dairying.*—A cow should produce 10lbs. to 12lbs. of butter per week to be profitable. Stick to one breed of cows and do not cross. The purchase of a Babcock tester by the Branch to test all cows is well worth considering, and any animals that do not give a suitable test ought to be discarded. *Pig Raising.*—This is a side line that seems to fluctuate; the price of pigs has been low for the last few years, but an export trade has now been built up, and prices may be better next year owing to many of the breeding sows having been sold. *Poultry.*—If poultry is kept, treat it as a side line. Roosters need not be kept because infertile eggs realise better prices and it is cheaper to buy day-old chicks from the hatcheries.'' Mr. Brown used the following diagram to illustrate the wheats suitable for this district:—

Season.	Early.	Mid-Season.	Late.
Between Germination and Blooming	116 days	136 days	154 days
Between Blooming and Ripening	24 days	25 days	28 days
Between Germination and Ripening	140 days	161 days	182 days
	King's White Gluyas Sultan Smutproof Waratah Nawab Felix Aussie Totadgin (W.A.) Bencubbin (W.A.)	Ranee Ford Free Gallipoli Sword Daphne Currawa Federation Hard Federation Dan Nabawa Caliph Wannon	Leak's Rustproof Sepoy Turvey Dart's Imperial Bena Major Yandilla King Silver King
Growing Period	June to October	Middle of May to October	April to October

If the season does not open in April, commence with mid-season wheat.

October 10th.—Present: 13 members.

How to Make Farm Life Attractive.—The following paper was read by Mr. E. Berry:—''The man on the land since the last drought and the depression has had to continue producing all kinds of produce, most of which he sells at a loss, yet he still sticks to his job even through perhaps he is heavily in debt. There are some producers who would be much better employed at other work. But most of the producers have done their share towards helping Australia back to her present position. Primary producers have a right to ask for assistance to carry on, because the Commonwealth or State cannot carry on with 56 per cent. of the population living in the cities. This season promises to be a record harvest for wheat, for lamb production—though not for export on account of the prices being low and producers holding their lambs because of the abundance of feed. There is also a record production of dairy products. With all this extra production producers still cannot pay their way at present-day prices, and it is necessary to take some step to bring down the cost of production nearer to the level of what is received for the products, through reducing the tariffs, freights, land taxes, interest, &c. Twenty years ago wheat was 3s. 5d. to 3s. 7d. per bushel at country sidings and cornsacks were 6s. 9d. to 7s. 3d. To-day wheat is 2s. 9d. and cornsacks at 8s. 6d. to 9s., and binder that cost £36 20 years ago costs £72 now, and almost everything that the producer uses has increased 50 per cent. to 100 per cent. in price. Freight alone has increased 60 per cent. in the last six years. Turning to another phase of the subject, we can do much towards keeping the boys and girls on the farm by having the best that we can afford in the way of horse teams and dairy cows, &c. It seems to make the work easier if you have a good team, one that you can be proud of. Do not always be dealing the horses away for others; nothing discourages a boy more than to break his team up just as he has got them working well, and the girls would far sooner sit down to milk a pure-bred cow than a mongrel. It is only fair that in the slack periods of the year we should allow them a half-day off—preferably Saturday—so that they can indulge in their favorite pastime. Then we can do all we can for the local town by keeping as many employed in it as possible, which assists the school, social functions, &c.'' (Secretary, L. Davis.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Upper Wakefield	13/10/32	7	Annual Report	C. Neumann, Halbury
Wasleys	13/10/32	25	Address—Messrs. Taylor and Cundy	C. Currie
Wasleys	20/10/32	150	Annual Social	C. Currie
Greenock	14/11/32	37	Address—W. Bennett, B.V.Sc.	A. Schubert
Lyndoch	8/11/32	15	Addresses—Messrs. A. Taylor, O. Cundy, and Turner	J. Hammatt
Tarlee.........	18/10/32	7	"Concrete"—Mr. Moore	C. Kelly
Yandiah.......	14/10/32	14	Tour of District	F. Jettner
Penwortham ..	11/11/32	14	Conference Reports......	A. Jenner

YORKE PENINSULA DISTRICT.

BOOR'S PLAINS (Average annual rainfall, 15.61in.).

October 6th.—Present: 45 members and visitors.

Wheat Diseases.—Mr. V. A. Prider, of the Kadina Agricultural High School, read the following paper:—"Nearly all of the common and most disastrous diseases of wheat and cereals generally are caused by microscopic living plants known as fungi. These small plants are parasites, *i.e.*, they live on the living plant, absorbing sap and food material which would otherwise go towards developing the plant itself. When one considers the size of these minute plant pests, it would seem an almost hopeless task to deal effectively with them, but they can be controlled and checked to a certain extent, and a knowledge of the way these fungus diseases work and live and carry over from one season to another should be a big help towards effective control. ***Red Rust or Stem Rust of Wheat*** (Puccinia Gram.) ***and Barley.—Life History***—The first indication of this disease is the appearance on the stem and leaves of the green wheat plant, usually during the spring, although they sometimes appear during a mild winter, of elongated reddish spots, which become raised like blisters, and eventually burst, revealing the familiar rusty red powder, from which the disease gets its name, Red Rust. This stage is known as Spring Rust. This powder consists of thousands of spores—these are the fruit of the disease and resemble seeds—on short stalks. These spores mature in a few days and fall off their stalks and are blown about by the wind, which accounts for the very rapid spread of the disease through a crop. A spore which falls on a plant germinates and sends out a thread (mycellium) which enters by a breathing spore, and thence into the cells of the plant, where it absorbs the sap and food material which passes through those cells. These spores, when they come to rest on a plant, will not germinate unless there is moisture on the portion on which they alight. Warmth is also required. Hence, warm, sultry weather, following rain or heavy dew, provides them with the conditions necessary for growth and the disease commences in full vigor. The humid weather prevents the too rapid evaporation of moisture from the surface of the plant and gives time for germination, and although the amount of water is almost microscopic, it must be remembered that the spores themselves are extremely small. Clear, dry weather, of course, dries the plants rapidly, not giving the spores time to germinate. If muggy weather continues, the disease spreads with remarkable rapidity, the spore multiplying by the thousands. *Epidemic under Suitable Conditions*—Later on in the season, as the plants dry out, black spores appear among the red ones, the latter generally disappearing. These are the summer spores of the disease, and this stage is called Black Rust, and it is merely a more advanced stage of the same disease; the spores will not germinate until the following spring, and hence are known as resting spores. In Europe, the completion of the cycle is simply that these resting spores carry over on various plants until the following spring, when they germinate, producing, after a rather complicated process, the red spring spores, which commence the infection afresh. In Australia, however, no one yet has been able to definitely show how wheat plants become re-infected, because the resting spores will not germinate out here. No native plant has been found as yet which acts as a host, although such grasses may occur, and scientists are searching earnestly for them. Other theories are that the red spores are floating about in the air in enormous numbers ready to infect plants at the first favorable opportunity. Spores are also found in the 'brush' of the wheat grain, thus unpickled seed may be a source of infection as fungicides would kill such spores. Wheat dropped after harvesting, which germinates with the first rain, affords another possible means of spreading the disease. The theory that spores are carried over in sheltered places or in the air seems to be as reasonable as any. Wind may carry spores from an infected district for many hundreds of miles. Anyway, it needs only a few thousand spores to start a serious infection. *Effects on Crops*—The damage done may be in some cases very disastrous, for in a short while, about a month or even less, a very promising crop may be reduced to a disappointing failure. Generally speaking, the younger the crop the more serious the result; sometimes the result is death of plants. Late sown crops may be seriously affected, not being far enough advanced in spring when the disease appears. By absorbing sap which would otherwise nourish the plant, the disease starves it, thereby stunting the growth and interfering with the formation of the grain, which may be in some cases mere dried up skins, and in others pinched and small; generally, it is unsuited for milling because of the dust. The weight per bushel measure is always affected. Hay crops infected with rust usually weigh less and are lacking in quality due to the retarding of the crop and to the presence of the spores, and also the spore dust affects both the digestion and the membranes of the mouth and nose of the stock. *Methods of Control*—Control is very difficult and no direct practicable method has yet been devised. The solution seems to rest in growing varieties which are resitant to the attacks of the spores and to grow early maturing varieties which are too far advanced when rust appears to be badly affected. Breeders have been working all over the world in an endeavor to discover varieties which are resistant, but the difficulty which has arisen now is that there are many different strains or forms of the disease and different districts are affected by a certain strain of the rust fungus, and a variety which is resistant to the strain in one district may be susceptible to the strain of another district. All varieties are not susceptible to the same degree. Resistant varieties show plenty of evidence of disease, but are not badly affected by it. So far only a few strains have been found in Australia. However, this seems to be the best method of control and perhaps breeders may breed resistant varieties. Nabawa is one of the most resistant varieties. *Take-all*—Take-all is also caused by a parasitic fungus which lives on the roots and the basal portion of the stem. The spores of this fungus remain in the soils from the previous season, and when cool, moist conditions occur, they germinate, attach themselves to a host plant, and grow with it. In the seeding and half grown stages, if the disease is serious, the plants are killed, whilst with more mature plants prematurely ripe or 'whiteheads' containing no grain are formed. Affected plants are usually easily recognised by the appearance of the base of the stem and the roots. The latter are poorly developed, brittle, and break easily when pulled up; they show an abnormal development of root hairs and present a tufted appearance. Usually the existing roots are short, thick, and weak, showing none of the penetrating power of a healthy root system, and there are very few of them. At the base of the stem there is a black or brown discoloration for nearly 2in. The stem also has a well rotted appearance in later stages. In the paddock, individual plants may be attacked or 'no growth' patches may occur, the latter of which are more or less round and of varying size, and in these patches the affection seems to get more severe towards the centre, where the plants are much more backward than those towards the outer edges. The spores remain dormant in the soil from the previous year—very hot conditions do not kill them—and when they germinate under suitable conditions, they send out long threads, which on finding a suitable host attach themselves to the roots and portions of the stems at about ground level. These threads can travel through the soil from plant to plant, hence are able to spread the fungus. They enter the plant and then commence to absorb the sap and nourishment from the plants, roots, &c., and divide and subdivide many times as they are fed. On the stems, these threads form the thick, dark mass mentioned above, resembling felt which peels off when dry. This, of course, produces the spores. Inside the tissues of the plant the threads produce their fruit or spore cases, which are similar in shape to a flask, the larger end being inside the plant, and the smaller end protruding. These cases contain numerous little sacs, each containing eight spores. When ripe, the spore cases expel the sacs and the spores are set free for further infection. *Method of Control and Prevention*—Grain harvested from a crop infected with the disease is not likely to be infected with spores, because the spores live on the roots and basal portion of the stem, so grain from an infected crop is not likely to be an important factor in the infection of a crop in the following year. However, crops grown on the same land after an infected crop are liable to worse attacks than before, because the spores are in the soil, particularly on the roots and stems of the previous year's plants in much greater numbers than previous years, and so the disease will get worse and worse. The chief methods of prevention are:—(1) Burn the stubble—the heat thus generated will kill a certain number of the spores by burning affected roots, &c. (2) Growing oats in rotation following wheat; oats are not badly affected by take-all, and, hence, tend to starve out the disease. (3) Careful preparation of the land—by keeping the fallow clean host plants are kept away from the fungus. The fallow causes many to germinate and these die through having no host to feed them. Barley grass is one of the weeds affected by take-all. A compact seedbed does more to check the disease than perhaps anything else. This is due probably to the fact that the fungus needs a plentiful supply of atmospheric oxygen, and a compact seedbed does not provide its requirements in this direction. It is a well-known fact that a loose, open seedbed tends to increase the disease; hence, early fallowing may be strongly advocated or else artificial means of compacting the seedbed must be resorted to, *e.g.*, rolling, &c. (4) Resistant varieties—Some varieties appear to be more resistant than others. These have tough, shiny chaff, &c.—Gluyas, Late Gluyas, Caliph, Leak's Rustproof, Yandilla King, &c. (5) Late sowing in dry seasons with early maturing varieties to enable rains to compact seedbed. The smuts do a great amount of damage to wheat, perhaps more than any other of the diseases because it is consistent in its attack; it is found every season in every wheat district, while other diseases are more or less spasmodic. The smuts are especially recognised by the dark-brownish spores they produce in certain parts of the plant. They all act somewhat similarly. The spores germinate at the same time as the wheat grain and send out a thread, and this grows up through the plant to its growing tip, where it keeps pace in growth with its host. When the plant matures, the thread joins and produces spores which appear in the ears, as in the case of 'bunt' and 'loose smut.' *Bunt or Stinking Smut* (*Tilletia tritici*)—The spores which remain on the grain germinate at the same time as the wheat, sending out their threads. The threads enter the seedling plant and grow through the cells to the growing tip, and here they remain, keeping pace with the host in growth. The plants show little sign of infection until the formation of the heads, this being a characteristic of the smuts. At flowering time, the threads, which are growing with the plant, enter the flower, and although the flowers fertilise, the smut attacks the grain, which is just forming, in a similar way to cancer among humans, *i.e.*, changes the substance of the grain into something foreign, until, when the plant dries out, the grains are really masses of bunt spores surrounded by the wheat skin. These are known as bunt balls or smut balls. The spores have a characteristic evil smell. There may be 6-9 million spores in a bunt ball, which when broken during threshing broadcasts 6-9 million bundles of trouble among healthy grains, this being the most important method of infection, the spores being caught and held in the brush of the grain. The head of an affected plant resembles a healthy head, because the bunt balls are securely held in the cocky chaff as healthy grains are, although the head usually has a loose, open appearance, due to the fact that the spores force the ears open, causing the spikes to stand out on the axes. Sometimes the head is only half smutted. This is due to the strong growth of the host, which gets slightly ahead of the disease. *Effects on Crop*—Firstly, bunt causes a reduction in the yield which is obviously destroying the grain (this being up to 70 per cent. in bad cases), and, secondly, it affects the quality of the remaining grains by contamination from the evil smelling spore dust. This, of course, renders it unsuitable for milling, hence low prices. The hay is not very good for feeding to stock. *Control*—Infection from smut may occur in two ways; first, from the spores on the grain; secondly, from spores in the soil, but where fallowing is practised the infection tends to diminish as the spores germinate without infecting, and then die. The chief method of infection in Australia is from the spores on the grain, and the method of control is to kill these spores with a fungicide, in addition to selecting clean seed, if possible. *Wet Pickles*—As the spores are held in the hairs on the end of the grain, thorough wetting is necessary, because bubbles of air remain on the surface of the grain and in the brush at the end. To do this, the grains should be rubbed together by some means or another, and by turning the seed on a floor after the pickle has been poured on is a good method of doing this. The seed should be turned several times, complete immersion makes quite sure that the bunt balls are floated, and this is so important in badly smutted wheat, but in the opinion of some experts this is not as important as the rubbing of the grains together—winnowing would probably remove bunt balls before pickling. Anyway, it is a matter of opinion that the solutions should be sufficiently strong, but not too strong. Bluestone, 1 per cent. to 1¼ per cent. solution. Formalin, ¼ per cent. solution of commercial formalin in water. The time of immersion is about three minutes. Both these pickles are efficient when used properly, and the spores are killed, although they have several faults, firstly, they kill a certain proportion of grain (due to damage to the coat of the grain) and probably copper sulphate is worse in this instance; secondly, they cause the germinating powers of the grain to deteriorate considerably, getting worse during the first week or fortnight left unsown. Hence, the seed is usually seeded after the pickling process. However, if the seed is thoroughly dried, then bagged after the first week, the germinatnng powers improve gradually until about one month after pickling when a better germination is usually experienced than when sown immediately. If allowed to dry, do not sow before the first fortnight. Copper carbonate is the latest development and is coming more into favor. With this pickle the smut is not killed on the grain until the seed is sown. When the seed is sown the pickle comes into contact with the soil moisture, producing a copper fungicide, which kills both spores on the grain and in the soil, although with badly smutted grains it is not so efficient as the wet pickle, with spores on the grain. It does not cause the germinating powers of the seed to deteriorate and can be done at any convenient time. The seed, however, must be thoroughly dusted, hence an efficient machine is necessary; 2ozs. of dry copper carbonate must be used, and the powder must be fine, the fineness being most important. *Loose Smut or Flying Smut (Ustilago tritici)*—This smut grows with the plant in much the same way as bunt, but although it affects the head of the ear, it affects it in a different way. The head is reduced to the central stalk or rachis and a mass of loose, black spores (not in the form of balls) which are blown away by the wind. No glumes, *i.e.*, cocky chaff, or awns develop on the spike. This occurs at about flowering time, and the spores from infected plants are blown to neighboring plants which are just flowering. The spore comes to rest in the stigmas of those plants which have them hanging out, where they germinate and send tubes down into the flower ovaries. They then go into a resting stage, and the grain which has been developing meanwhile forms about it, consequently this furnishes us with a reason why loose smut is hard to combat, namely, that the disease is inside the grain, and unfortunately none of the treatments for bunt will touch it. No infection can be seen from the appearance of the seed. So far the disease has not reached serious proportions in South Australia so that the loss is small, and the cumbersome water method does not warrant its use in most instances. *Flag Smut (Urocystis tritici)*—The appearance of this disease is denoted by the appearance on the flag of dark greyish or bluish black lines which run parallel to the sides of the leaf. They vary in length from 1 cm. to the whole length of the leaf. The leaves are twisted and malformed and often they disintegrate and fall to pieces just as if burnt away to ash. They are of a bluish grey color. If the heads are formed, they are usually small, sterile, and smutted. Infected plants never grow to full height, and may just struggle on, or die. The lines on the leaves or stems are blisters which eventually burst, liberating masses of black spores which scatter through the soil and crop for further infection later on. Next year they germinate with the wheat, and enter the young wheat plant before the first true leaf appears. Pickling does little to prevent this disease, because the spores are in the soil, and even in bare fallow these spores are known to exist for four years, so they are very hard to kill. The damage is in the reduction of yield, due to the heads not forming or producing grain. *Control Measures*—The stubble should be burnt, thus killing many spores, whilst early fallowing is urged to encourage germination of the spores which will die if they have no host plant to attack; early sowing seems to encourage it. One of the latest developments is the use of resistant varieties, of which Nabawa is the best; this means has not been fully investigated as yet. *Eelworms*—The eelworm is a minute worm, about 1/25 of an inch long when fully grown, and although it is a parasite it is not by any means a fungus. It has been proved lately that many 'no growth' patches in crops have been due, not to 'take-all' or 'foot-rot,' but to the eelworm. The eelworm remains from one season to another in the soil as eggs in little egg cases which were produced the season before. When conditions are favorable, the eggs hatch out and minute worms emerge (1/70in. long).

These make for the roots of young plants, probably attracted by juices from roots, where they bore into the fine tissues, and commence feeding on the juices of the roots. The female gradually swells and the body is forced out of the tissue, leaving the head inside. Male worms then fertilise the females and eggs are produced, which cause the females to swell further, forming small lemon-shaped cysts on the roots of the plants, which may now be seen. They are whitish in color and contain about 100 eggs. The period of the cycle from hatching to mature adult is about four to five weeks, so that during the growing season of the plants, if soil conditions are suitable for hatching the eggs, there may be more than one germination in one season. Moisture and warmth are needed and these conditions are usually supplied at about April, when the first winter rains and the young worms hatch out about the time when the young plants begin to grow. Eggs which are produced late in the season drop off the roots and remain in the soil for further infection next year.''

There was an excellent attendance of members and visitors at the crop inspection, which took place during the day. (Secretary, S. Chynoweth.)

BRENTWOOD (Average annual rainfall, 15.54in.).

September 1st.—Present:—11 members.

Wool, Sheep, and Fat Lambs.—Paper read by Mr. J. Boundy:—''Sheep for wool is an all the year proposition, that demands full flock strength during the period of feed and water shortage. Many farms have a feed glut period during winter and early spring when water is plentiful, that cannot be exploited to the full when wool alone is the object in view because of the lean months which follow. Most producers suffer from a shortage of feed or water at the same period of the year so that profitable quitting of flock surpluses are not always possible. The majority of wool men keep a fair percentage of wethers in their flocks that in the event of overstocking would be placed on the market together with the culls from the ewes, because no one desires to sell breeding ewes. Butchers supplies are in this way augumented and prices decline. Sheep are necessary on most farms as a sideline, to eat off surplus feed, and to help in keeping fallow clean. They help in compacting the soil and avoid overworking when the soil is dry. The question then is as to what type of sheep to keep. It might appear as though there is very little profit to be made out of sheep of any type or for any purpose, but the indirect benefits obtained help in some measure to offset their apparent unprofitableness. No farmer should be under the necessity of buying from the butcher his meat supply or of asking for his neighbor's sheep to eat off surplus feed. Fat lambs, even at the present low prices, seem to be the most profitable investment, provided that big, roomy ewes are mated with either Dorset or Southdown rams so that rapidly maturing lambs are obtained. The best cross for the big framed Merino ewes is the Dorset, since with that cross a lamb is obtained that is a rapid grower, with fairly even conformation, that can be marketed in from 10 to 15 weeks. The Southdown-Merino cross seems to have a much slower growth, but retains its lamb characteristics much longer than does the more rapidly maturing cross which is of advantage when waiting for a market. It appears, however, that the better Southdown cross lambs are to be obtained from the mating with long wool ewes such as the Border Leicester to obtain the rapidly maturing characteristics that are necessary for early marketing. In June of this year, lambs were bringing from 15s. to 20s., at the present time they are worth from 6s. to 8s. Even at this low figure, they are a better proposition than wool alone. If a sheep is kept for 12 months and it shears 12lbs of wool at 8d. a pound a return of 8s. is received equal to 8d. a month. If a fat lamb is raised and it is sold for 6s. 6d. it is equal to a return of 2s. 2d. per month when feed is plentiful and in addition the ewe will cut 10lbs. of wool at 6d. per pound, equal to 5s. a ewe or 5d. a month. Total return from ewe and lamb 11s. 6d. per year. The total return per month from the lambing ewe is 11½d. and the lamb is kept 3 months only, when best able to do so. It is very necessary to use good rams and to choose the proper type of ewe whether the Merino or Longwool. If mating Dorsets and Merinos it is advisable to use a mature ewe or lambing losses may cause all profits to disappear. Ewes are better kept on sparse pasture during lambing, so that they will take the necessary exercise, but in any case attention at this time usually pays.'' (Secretary, G. Carmichael.)

SOUTH KILKERRAN.

October 4th.—Present: Nine members.

Wheat Growing.—The monthly meeting was held at Mr. E. Heinrich's residence, the following paper being read by Mr. L. Hasting:—''In making wheat growing a success there are many very important points to consider. It is not just a matter of sowing the seed and reaping the grain. One of the first items to ensure success is the preparation of the fallow. It is impossible to make a hard and fast rule as to how the fallow should be worked, because the soil varies so much from one district to another. I therefore propose to direct attention to limestone and red loamy soils, with which I am most familiar. Fallowing should commence during July and be finished by the end of August; a plough being used for the work. Deep ploughing is not necessary in this district—2in. deep is sufficient. After the first ploughing the land should remain in a rough state for several weeks to allow the rain and sunshine to get well into it, then after a good rain it should be harrowed to break the clods and pull the weeds about. Three or four weeks later the fallow should again be worked, and again just before harvest, when summer weeds begin to make an appearance. For this working a spring-tooth may be used, and then the fallow should be left open. Should a good rain fall during harvest or through summer, do not lose any time getting on to it with the harrows. This will stir the summer weeds about and leave a level seed bed for the sowing of wheat. Never work the fallow when it is dry unless it is absolutely necessary. Sheep are a big factor in preparing proper fallow to ensure a successful wheat crop, they assist in keeping the fallows clean and in consolidating the seed bed. The depth to sow the seed should be about 1½in. The seed should be carefully selected, varieties being obtained which are most suitable for the district. Do not sow too much of a new wheat until it has been tried out. Watch carefully foi new wheats that are likely to improve yields, but for the first year about 10 acres of any new wheat is sufficient to risk, and this should be sown in the same paddock as other wheats that have proved themselves. It is not advisable to sow a wheat too many years before getting a change of seed. The seed should be graded or put through a winnower prior to seeding. At seeding it should be pickled to produce wheat free from smut. Do not sow too heavily—65lbs. of seed per acre is ample; there is always the tendency, when sowing thickly, to produce a big crop of straw with small heads. A high grade super should be used, say 45 per cent., and about 112lbs. applied to the acre. Seeding should commence after the first good rain at the end of April or beginning of May. When the seed has been sown it should be harrowed about three or four days afterwards, when the weeds have just started to freshen. Care should be taken to prevent wild turnips from going to seed, these should also be destroyed in the paddocks not under crop. A early wheat should be sown around the fences, so that it can be cut early and carted out of the paddock before the other wheat is ready for reaping. Before starting to reap make sure that the machines are in good working order; loss of time when the crop is ripe is also loss of money. A good, clean sample of wheat should be produced for sale, there is no excuse for having dirty samples with the modern machines now in use. It is essential that oats or barley be grown as a change for the land, because there is a tendency for the soil to become wheat sick, and a poor crop is the result.'' (Secretary,R. Hasting.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Weavers	15/11/32	8	"Wheat and Barley Production"—J. Honner	H. Cornish, Stansbury

WESTERN DISTRICT.

BALUMBAH, September 21st.

Present: eight members and four visitors.

Care of Farm Horses.—The following paper was read by Mr. W. Riches:—''The care of horses is one of the main points in farming. If the horse is well inside the outside will look after itself. On the West Coast, I have seen many horses which appear to be suffering from blood worms. The worms penetrate the stomach and find their way into small veins and in time locate themselves in the main arteries and form lumps which cause a stoppage. Then the horse becomes sluggish and hairs stand up and become dry and split at the ends. Horses suffering from blood worms may appear to look well with good coats, but a sudden change of food, no matter how good, and they at once start to go back. The best treatment is to starve the horse for at least 12 hours, then give him one pint of raw linseed oil with three ounces of turpentine. If this is not effective, repeat the dose and when he has quite recovered from the effects of the oil give Fowler's solution of arsenic at the rate of two tablespoons once a day mixed in a small feed. *Shoulders*: After horses have been turned out for a while it is bad practice to work them a full day for a few days, because they scald easily. If worked too hard for a start the scalded shoulders become sore and are hard to cure. Work the horses a few hours a day for the first week. Also watch the shoulders and directly a mark is noticable, change the collar for one which fits properly.'' (Secretary, A. Jericho, Kimba.)

October 19th.—Present: Eight members.

The Agricultural Bureau.—Under the title "How to Stimulate Interest in the Work of the Agricultural Bureau," the following paper was read by the Hon. Secretary (Mr. A. Jericho):—"There are various means by which a farmer can improve his general knowledge. One is by travelling and observing various methods practised in different districts, coming into contact with different farmers and discussing with them items relating to agriculture. Circumstances and time are usually against this method of learning. Further, one can experiment and carefully observe the finer points governing the essential workings on a farm. But experimenting at all times is more or less unprofitable. Another means would be to read all the required information. This is rather a selfish practice, because if it is worth one's time to study another man's experiences, it should also be time well spent giving the other man some of our experiences in return. The prosperity of a district is usually gauged by the number of prosperous farmers in it, and, further, the individual benefits by the prosperity of the majority. The more active the members of a Branch are the more knowledge will be gained. *Officers*—At the first meeting or annual meeting of a Branch quite a number of members are willing to accept an office, but before the end of the year they are full of regrets. Therefore a member should consider his position carefully before accepting office. The Chairman holds a very important position. He should be conversant with all the rules and keep the meeting as strictly to business as possible. He should encourage all members to take part in discussions, see that they keep to the subject, and finally close the discussion before members become disinterested. The Hon. Secretary should be enthusiastic, the success or failure of meetings will be greatly determined by his attitude toward them. He is responsible for the amount of material to be dealt with at a meeting. He should gauge this by the correspondence and subject of the paper to be discussed. The Secretary, as well as other members, should also encourage new members, and if the meeting is interesting and business-like they will not hesitate to take an active part. The two above-mentioned officers can safely be said to be half the success of a Branch of the Agricultural Bureau. Every member should be prepared to do something towards making meetings successful. No matter how small the effort always remember 'Small efforts by the individual become great accomplishments collectively.' A small number of active members can gain more knowledge than a large number of those who are indifferent. Finally, members should not neglect to attend meetings, either locally or in Adelaide."

GREEN PATCH (Average annual rainfall, 26.56in.).

October 20th.—Present: Six members.

Meeting held at the residence of Mr. C. J. Whillas. A short paper on "Shearing" was read by Mr. R. Sinclair. He stressed the necessity for thoroughly cleaning out, scrubbing, and disinfecting the shearing shed before starting shearing to prevent tetanus. This year's clip he proposed having reclassed by the experts at Port Adelaide, and if it paid he would do the same in future. Reports of the Lower Eyre's Peninsula Conferences were given by Mr. Adams.

LAURA BAY.

September 6th.—Present: 13 members.

Tomato Culture.—Mr. F. Sims read the following paper:—"Plant the seed during June in boxes and have a covering that can easily be placed over them at night as a safeguard aganst frost. A good cover can be made with two old bags cut open and sewn together to form a sheet. When the plants are about 2in. high, transplant them into another box to harden, and to give them more room. Finally transplant into the open into ground which has been previously dug with not too much manure. When the plants are showing the first flower buds; and as the weather gets warmer place a good mulch of stable manure on top of the ground around the plants to stop evaporation during summer. Keep the soil damp until the first fruit sets then water at least twice a week, always keeping the ground well hoed and loose. Spotted Wilt is the most serious disease for out-door tomatoes and causes heavy losses in the season. Indications of the disease are that the young leaves turn a bronze color and the plant has the appearance of not having enough water. Wilt will attack the plants from seedlings through all stages but disappears as the weather becomes hot. There is no effective cure for this disease but a spraying of nicotine and soap at intervals of 10 days, or dusting with nicotine dust or pulphur will sometimes check it from spreading."

MILTALIE (Average annual rainfall, 13.56in.).

September 17th.—Present: Seven members and five visitors.

Local Experimental Plots.—Mr. W. Smith read the following paper:—"The local experimental plots serve a very useful purpose in its district, but they cannot serve fully the varied soil conditions. To prove the best methods of farming in this district, it would be necessary to have at least two sets of experimental plots to be varied according to local conditions. Probably the reason that more voluntary experimental work is not done is that it is not an individual's job. Twelve to 14 plots should be conducted in this locality, besides wheat variety tests, which should consist of not less than six varieties of wheats which are likely to be most suited to the district. Although Mr. Griffiths (Agricultural Instructor of Murray Mallee District) in his report on crop competitions in that area for the years 1926-31 says, 'Correct cultivation and rotation practices are the most important factors in wheatgrowing, and it is certain that next in importance is the fertiliser used for the crop. When studyng the individual results it is always noticeable that the leading crops have been sown with heavier dressings of super, while those sown with small amounts are lower down on the list. Possibly the higher dressings are not so necessary in low rainfall areas, although the results of South Australian experimental fertiliser tests in such areas do not confirm this.' Mr. Griffiths has judged 800 competition crops in his district, and according to his lengthy report in *Journal* of June, 1932, he has kept a fairly complete record of all treatment and operations in connection with crops judged. In 1929, when only 11.30in. of rain was recorded in this district, and owing to the dry conditions, the fallow on heavy clay land could not be worked down before seeding time. Local manure plots conducted in that year showed that 1½cwts. 45 per cent. super gave an increase of 1bush. 40lbs. over the 1cwt. plot, which, considering the conditioins under which the crop was grown, was quite satisfactory. In looking up the reports for some years past of our experimental farms and tho various experimental plots it is quite evident that nothing less than 1cwt. super dressing is an economic amount in the majority of cases. Super experiments, Minnipa, 1916-28.—Average annual rainfall, 12.89in. Report states definitely that for full returns applications should not be less than 90lbs. or more than 180lbs. Rudall experimental plots.—Average annual rainfall, 11.72in. Highest net return secured from 1cwt. 45 grade super for past five years. Super experiments, Veitch's Well.—Average annual rainfall, 11.86in. Years 1920-28 report.—The yield of both wheat and barley improved with increasing applications of super up to 2cwts. dressing, but when 3cwts. were applied the yield was reduced by a few pounds. The most economic dressing for wheat appears to lie between 1cwt. to 2cwts. of 36 per cent. super (or its equivalent) per acre. In the heavier rainfall areas, heavier dressings have shown the best returns. From a mixed farming point of view it is interesting to note at Roseworthy Agricultural College a summary of a report showing influence of heavy and light dressings of super on sheep-carrying capacity of land. The summary reads:—'The farmer applying ½cwt. of super to his wheat crop can carry ⅓ more sheep than the farmer who uses no manure; the farmer applying 1cwt. of super, ⅔ more sheep than he who uses no manure; the farmer applying 2cwts. of super twice as many sheep as the farmer who uses none; and the farmer applying 3cwts. of super 2⅓ times as many sheep as the farmer who uses none.' The suggested set of experimental plots should include two plots to demonstrate the advantages of fallow-wheat-oats rotation over fallow-wheats-grazing. Even at the present low price of oats the rotation including oats would probably show a fair return, even if not harvested, but left for sheep to graze. There is nothing better than oats to clean up old dirty wheat-sick land providing the oat crop is fed down hard with sheep in the early spring and then allowed to seed. The fallow-wheat-oats rotation could be worked in conjunction with two plots of oats, one to be grazed hard with sheep in, say, August to demonstrate the difference in yield, &c., over the plot not grazed. There appears little information available in connection with the feeding down of oat crops, the same to be closed up later and allowed to mature grain. An experiment with the grazing down of an oat crop in this district was carried out in 1930. Algerian oats 24 acres combined in on wheaten stubble with 30lbs. super June 7th and harvested December 13th. Of the 24 acres, 17 acres were opened up to a 900-acre paddock which was carrying 280 ewes with lambs. On the 1st August the sheep were allowed on the oat crop which by this time had made good growth, covering up the ground nicely. The sheep did well and appeared to prefer the oat crop to the rooted grass country, and by the end of the month, when they were taken out, the crop was grazed down very bare, even all weeds such as turnip, dandelion, &c., were almost grubbed out of the ground. Two 1-acre plots were measured off and harvested. The 1-acre grazed plot yielded 23bush. 14lbs., and the more grazed acre gave 20-bush 4lbs., a difference in yield of 3bush. 10lbs. in favor of the grazed plot. The following month—September—proved rather dry, only 59 points being registered, and it was not until October 19th that good rains fell. So far as this experiment is concerned, it would appear that the land carrying the grazed crop gave a very much better return than that which was not grazed, apart from the oaten stubble grazing which would be about equal, the grazed plot probably carried from one to two sheep more per acre per annum; it produced 3¼bush. more grain; no weed seeds matured, and the land had the benefit of the sheep's droppings. Like the amount of the dressings of super in this district, there appears also to be much varied opinion as to the most profitable seeding rate of wheat. The suggested set of plots should include three rate of seeding plots, the quantities running out at, say, 30-45 and 60lbs. per acre. An extract taken from a seeding rate report of Minnipa Experimental Farm reads:—'The following results have been secured from 11 years' work, and therefore can be accepted as fairly conclusive evidence. The highest return has been obtained from the 75lbs. dressing which has yielded exactly 1bush. more grain per acre than the 60lbs. application, whilst an increase of 15lbs. in the seeding rate, making 90lbs. in all, has depressed the yield to the extent of 1lb.' From these figures a rate of seeding of from 60lbs. to 75lbs. per acre can be recommended for new land in the Minnipa district. Mr. Griffiths in his report states, 'The majority of farmers are sowing about 1bush., and all indications are that this is the correct average quantity for mallee areas with rainfall from 14in. to 17in.' Other reports of experimental seeding rates recommend 45lbs. to 75lbs. seed per acre. An oat variety test should also be included in the set of experimental plots. There is no doubt that if a set of suitable experimental plots were conducted in this district for, say, four or five years, the cost of same would be returned many times over.'' (Secretary, G. Smith.)

PINBONG.

September 3rd.—Present: 14 members.

The following paper on ''Fallowing'' was read by Mr. E. G. Jericho:—''Fallowing should be done when seeding is finished and the horses able to do the work. Stable feed the horses and get the work over quickly. I recommend a 7in. furrow plough, because one can plough shallow and make a good job. An eight-furrow plough is quite enough for 10 horses; if a wider cut is used, less furrows will be required. Fallowing should be 3in. or 4in. deep, and the mouldboards kept in good order. Harrow three weeks after to kill young weeds, and continue unless the weeds get too strong. Leave when cultivated, or if the fallow is so hard that it will not grow any more weeds. Feed with sheep before fallowing, because the plants will not be so strong then, and also keep sheep on the fallow wherever weeds show. In seeding time, a good seed bed should be 2in. deep and properly worked, or nearly 2in. deep. Use more super for fallow than new ground; harrow after the drill if there are any weeds, otherwise in wet weather use a light set of harrows behind the drill if necessary. Wheat can be drilled in 1in. or more with advantage. Working fallow in seeding time should commence as soon as weeds start to grow. Cultivate and harrow and drill a fortnight later, or use a combine to put in the crop. If possible, use a spring-tine cultivator for working fallow. If there are too many snags, a turn-over cultivator can be used with advantage, also when the land is too hard for a spring tine.'' Members thought that the combine was the best implement to put in wheat at seeding time, and all agreed that all workings of fallow should be done after rain to stop drift, and never to work fallow dry. (Secretary, C. H. Scholz.)

TARAGORO, September 15th.

Present: four members.

The Farm Clip.—Mr. J. Crook read the following paper:—''Sheep are a popular side line on the farm, and the clip is becoming to be recognised as a handy asset during the year, but farmers do not pay enough attention to the handling and classing of it. Few farmers shear their own sheep, and it is essential that the services of good shearers be obtained, who can handle sheep carefully and shear quickly and cleanly. Much depends on the throwing of the fleece on to the table. When this is correctly done, a fleece can be quickly skirted and any soiled pieces removed. The back of the fleece is usually dry in appearance and breaks very easily, and when not removed, reduces the whole of the fleece, to the price of that of the poorer quality. The fleece with the back removed, should then be folded and rolled from the tail to shoulder, thus showing the brightest and best quality of the fleece. All bales should be neatly marked and numbered with stencil plates, fleeces, bellies, and lambs wool being placed in separate lots. It is advisable with small lots to ask the wool brokers to reclass, for which they make a small charge. The farm clip is then classed by experts and interlotted with wool of its own class and it then brings the highest possible price. Repeated warnings, both by brokers and buyers about Australian wool being badly classed and containing burry, seedy pieces, and dirty wool, and cocky chaff and straw, are in danger of losing the high position in the market which we have gained with our fine Merino wool. Farmers clips are principally to blame through careless handling. Farmers should take more care with the clip and they will find that it will help to raise the price of wool. Raising the standard of one's flock, keeps wool to a high standard, but shoddy handling of the clip can often offset the advantage of a good class and wool producing flock.'' (Secretary, T. Winters, Cleve.)

WUDINNA (Average annual rainfall, 13.68in.).

August 26th.—Present: 13 members, six visitors.

Merino Lambs for the Export Trade.—Mr. R. Woodrup (Pygery) contributed the following paper:—''The suitability of Merino lambs for export from this district is a question which will now claim a good deal of attention, because the Port Lincoln freezers will be opening for the slaughter of export lambs. Farmers have been advised to go in for the crossbred lamb. Various crosses are mentioned, the best being Shropshire or Southdown-Lincoln-Merino cross. The reasons given are that the lambs mature fairly early and dress, when killed, a stylish carcass. While these crosses may be most suitably adapted to certain localities, much can be said in favor of keeping to the Merino for this district providing that the right sort of Merino is produced; large, plain-bodied ewes, clothed with a rather strong quality wool. Lambs from these sheep if dropped at the latter end of April or in May will, if properly looked after, make fairly useful types by the middle of September. One great advantage with the Merino is that any that are unsuitable at the time the consignment is drafted may still remain in the flock and produce a useful quality wool, and at the same time keep up the numerical strength of the flock. Again, there is not the trouble with Merinos crawling through fences, which is one of the objectionable traits of the crossbred. Further, there is not the trouble of trying to rear crossbred lambs and at the same time maintain a pure Merino section in the flock. Last year I sent lambs to the freezers to kill for export, with the following results:—35 lambs were marketed at the end of September, the returns being: Lambs, 1st grade 14, average weight 38½lbs. price obtained 3d. per lb., price per head being 9s. 7½d., plus price of skin at 1s. 5d. = 11s. 0½d. Lambs, 2nd grade 19, average weight 40½lbs., price 2¾d. lb., 9s. 3½d. per head, plus 1s. 5d. for skin = 10s. 8½d. per head. Lambs, 3rd grade 2, average weight 35½lbs., price 2¼d. per lb., price per head 6s. 8d., plus 1s. 5d. skin=8s. 1d. These are returns from lambs sold in London on December 16th from which, of course, must be deducted freight to Port Lincoln, which averages approximately 1s. 4½d. per head, leaving a net return as follows:—14 1st grade, average 9s. 8d.; 19 2nd grade, 9s. 4d.; and 2 3rd grade, 6s. 9½d. When one considers the low prices ruling for sheep of any description last year the above prices can be considered satisfactory, bearing in mind the short time the lambs are kept, and also that they do not have to carry through any lean period to obtain this result. If the prices of the popular Merino advances as a grazing proposition, while the export trade may remain low, it is no trouble to turn them into those channels if so desired.''

OUR DAIRY HERD.—Paper read by Mr. F. Johnson:—''With wheat at a price which is questionable, if it is not a losing proposition to grow, farmers generally have been hard hit by the low prices ruling, and have to consider other channels than wheat growing to bring their yearly income up to what is needed to carry on successfully. In years past the dairy herd occupied a conspicuous place on the farm, but as the price of wheat rose from 5s. to 6s. a bushel, this line of industry was neglected to a large degree, but the time has come when it must be again taken into consideration and utilised to the best possible advantage. While it is admitted that there is much work connected with cows, there is also a steady and regular income to be gained. Many who lived on the mainland at one time can remember the income derived from the dairy herd, and with four or five good cows, up to £3 per week was realised without any extra feeding or special attention. To get the best results from the dairy herd, it is necessary that the farm be not situated too far from a butter factory, and if there is a local factory it eliminates all labelling of cans, making special trips for empty return cans, and does away with high railage fees to and from the factory. The time is opportune when a decided move should be made in this district to get a butter factory established in Wudinna. With the wide scope of country, of which Wudinna is the central town, ample patronage of its services could be guaranteed. There is a radius of about 25 miles which would be served, and possibly supplies would be forthcoming from districts further up the line. The argument has been used that 'we have a factory at Port Lincoln; why do you want one here?' Only those who have had experience can speak authoritatively regarding the complaints which come to hand from time to time regarding the cream. The cream is rated as being second quality, and returns are reduced accordingly. If this is as stated, it is probably due to the fact that the cream has been kept too long waiting for a full can, with the results previously stated. With a local factory the cream can be taken in, even if it is only half full, and get top price for it, and also have the satisfaction of seeing the cream tested if desired. A reasonably good cow should return from 10s. to 12s. per week profit; this, of course, is governed by the prices of butter ruling. There is no danger of the market becoming over-supplied, because South Australia is often compelled to import butter from other States, thus proving she is not self-supporting in this particular industry. There is always a demand for Australian butter overseas, which commands a ready sale. All avenues of possible revenue to add to our depleted incomes should not be overlooked, and this is one which has not been given the consideration of which it is worthy. It may be stated that the cows now in this and the surrounding districts are of a nondescript type, and not at all suitable to form the nucleus of a dairy herd, and I would draw the attention of those who make these comments to the fact the bull is always recognised as being half the herd. With the advent of a good type of bull into the district (which has been arranged through the workings of the Wudinna Agricultural Bureau) it is only a matter of a few years before a wonderful improvement will be noticeable. Days of prosperity and high prices ruling for our products led us to cultivate expensive tastes, and also gave us a distaste for work which even though giving us a regular income, did not compare favorably with the returns from our wheat crops at that time, consequently they were neglected, and in some instances abandoned altogether. The time has come—in fact, it is overdue—when these minor industries must be revived and put on a sound footing. To do this successfully an endeavor should be made to get a butter factory established in the district; build up the dairy herds, and the major part of our financial troubles will disappear.''

Destroying Rabbits.—Mr. Daniels (Kyancutta) read the following paper:—''The rabbit pest is one of the great problems that agriculturists have to fight against.' In dry years, when feed is not very plentiful, they do not breed so quickly, and it is possible to keep them in check by using the poison cart once or twice a year. When feed is scarce they will take poison without any trouble, but in the good seasons early in the year they will not take the poison so readily, they breed very rapidly, and one has to deal with them by fumigating. Pumping bisulphide of carbon into the burrows is very effective, but is too costly; it is difficult to obtain, and there is a certain amount or danger in using it. Another machine is made to pump cyanide powder into the burrows. This, too, is very effective, but also is too costly. Another machine blows wood gas smoke into the burrows. This kills the rabbits just as well as the previous two, and is cheaper to run, but much dearer to buy. Using the exhaust gases of a motor vehicle is a very effective way of dealing with the pest. But there are certain rules which should be observed to prevent damage to the motor. Do not add used oil to the petrol. If the gas is not visible, a little clear motor oil can be added to the petrol with beneficial results; approximately ½ pint to 8 or 10 gallons of petrol. Exhaust gases normally consist of carbon dioxide, nitrogen, water vapor, and carbon monoxide. The carbon monoxide is the destructive agent. It is both odorless and colorless. Speed the engine up to quarter or one-third throttle when working on the burrows, and keep the oil pressure up to normal. Use a hose of ample diameter to prevent back pressure. The writer uses a flexible metallic hose 1in. in diameter and 7ft. in length, and connects it to the exhaust with a piece of rubber tubing. A check should be kept on the number of working hours to determine when the oil should be changed. It should be changed each 75 to 100 working hours. Overcharging of the battery must be avoided by switching on the lights, using the starting motor, and if necessary by reducing the charging rate of the generator. The battery is fully charged when the electrolyte in the cells begins to bubble with the generator charging. Running costs are low; about 7½d. per hour with a light six-cylinder car with petrol at 2s. 6d. per gallon. Finally, there is the light self-contained machine called the Avery exterminator. This machine has just been put on the market, and its success seems assured. The cost of machine is £7 10s., weight 25lbs., and the only fuel needed is slightly damp straw, grass, or cocky chaff. The machine needs one person to turn the small hand-blower, and creates a dense smoke sufficient to keep four or five men working filling in the holes, although the whole operation can be carried out quite successfully by one person. The smoke is positive in its action, killing anything which remains in the holes in a few minutes. If desired, sulphur can be put in with the straw. The machine is about 5ft. in length overall, and the container holds half a wheat-bag of fuel, which lasts from one to two hours. The machine can be carried about by hand, and altogether seems the best proposition of all. Trapping, of course, is effective, but is too slow where the rabbits are numerous.''—(Secretary, D. Duguid.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Streaky Bay ..	26/8/32	--	Address—W. H. Brownrigg	J. Drever
Miltalie	15/10/32	10	Congress Report	G. Smith
Goode.........	19/10/32	18	"Colt Breaking"—H. Jones	B. Linke, Ceduna
Yadnarie	18/10/32	7	Congress Reports	E. Spriggs
Laura Bay.....	10/10/32	11	Congress Reports	W. Edson
Pygery	8/11/32	8	Congress Reports	A. Day
Maltee	10/11/32	11	Papers from *Journal*.....	E. Schwarz
Waddikee Rocks	12/11/32	7	Discussion	W. Hier
Kyancutta.....	1/11/32	14	Congress Reports	J. Dyke
Kapinnie	4/11/32	6	Congress Reports	A. Giles
Yadnarie	15/11/32	9	Paper from *Journal*	E. Spriggs
Miltalie	12/11/32	9	Congress Reports	G. Smith
Mangalo	1/11/32	18	Congress Reports	K. Nield
Warramboo ...	15/11/32	11	Annual Meeting	E. Adams

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

MOORLANDS (Average annual rainfall, 14.76in.).

October 19th.—Present: Nine members.

Mr. A. Mann read a paper, his subject being "How to Make Country Life Attractive." —"The hardest problem for Australia to solve to-day is unemployment, and the only solution of that problem is back to the land. Unfortunately at present there is little to encourage anybody to go on the land—low prices for wheat, wool, fat lambs, &c., high railway freights, high cost of farming implements and fertilisers, and the horse is now almost unprocurable, even at very high prices. To help and encourage farmers and others to come and stay on the land I would suggest:—(1) Give a free pass on railways on the same principle as every railway employee gets when he has served 12 months on the railway. This should apply to everyone that has lived and worked, say, 50 or 60 miles from the city, on a farm or station for 12 months. (2) Reduce motor registration and the high duties on farming machinery and fencing material. If something is not done in this line in the near future, more and more people will be driven off the land and the State will be the loser. Another thing that is of great advantage to the man on the land is a good road to his nearest town or rail station to cart his produce. Millions of pounds have been spent on main roads, in many cases running parallel with the railway, which are of little use to outback settlers, who still have to cart their produce over bad roads." (Secretary, R. Wilmshurst.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Meribah	10/10/32	14	Debate—" Harvester *v.* Stripper "	E. H. Carr
Ramco	12/9/32	7	" Die-back of Apricots "—J. Boehm	J. Odgers
Overland Corner	7/9/32	16	" Neighborliness "—T. Atkinson	H. Loffler
Caliph	—	—	" An Agricultural Conundrum "—F. Richards	W. Todd
Kulkawirra ...	11/10//32	9	" Breeding "—O. Fitzgerald	H. Elliot, Karoonda
Alawoona	14/10/32	7	Congress Reports	B. Finey
Yurgo.........	1/11/32	9	Field Day	M. Walker
Marama	16/11/32	7	Discussion	T. Hinkley
Parilla	2/11/32	11	Address—A. Campion ...	C. Foale
Parilla	22/11/32	11 and 20 visitors	Illustrated Address—H. Johnston	C. Foale
Taplan	30/11/32	7	Paper from *Journal*	P. Hodge, Nangari

SOUTH AND HILLS DISTRICT

ASHBOURNE.

August 19th.—Present: Nine members.

The Hon. Secretary (Mr. H. Pitt) read an instructive paper, "Has the advent of Machinery Proved Beneficial?" The speaker traced the progress that had been made in the development of industrial and agricultural machinery and said that whilst it could be assumed that possibly one of the causes of unemployment could be traced to the present high standard of machinery, yet to libel such progress was to decry the giver of all present-day comforts, to stand in the way of the deliverer of child labor and endless drudgery, to oppose the messenger of fuller knowledge and greater achievement, and to turn back the herald of an era of progressively richer freedom for the sons of men.

A further meeting was held on September 21st and attended by 11 members, when the subject, "Will the Transport Control Board be Beneficial to the Country Districts?" was discussed.

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

September 5th.—Present: 12 members.

Mr. J. Turner exhibited some peach twigs which had been badly burnt by oil spray. The tree had been very forward when the spray was applied. The spray was a well-known white oil applied at the rate of 3galls. to 100galls. of water. The members considered this to be a dangerous strength to use on trees which were not dormant, and pointed out that this was good evidence of the necessity for having the specifications of all oil sprays. The Hon. Secretary asked for information *re* eradication of rats. Several members advised the use of tar in the rat holes. One member suggested that best results would be obtained by catching a rat alive and then liberating it after smearing it with tar. The rat would then take the offensive tar smell right into the most inaccessible places and drive the other rats out within a day or so. Mr. Turner read an article which advocated sprinkling powdered sulphur (10lbs. sulphur to 50 tons hay) on every third layer of a hay stack while being built in order to keep out mice and rats. Other members stated that this method was very successful. (Secretary, H. Goldsack.)

November 14th, 1932.

ORCHARD SPRAYS: LIME SULPHUR SERIES.

[G. H. Cunningham, *New Zealand Journal*, April, 1932.]

Spray injury resulting from the use of Bordeaux mixture against black spot of apples led to the development of lime sulphur as a summer spray by Cordley in 1908 in Oregon, America.

Lime sulphur is prepared by boiling together in water measured quantities of lime and sulphur (100 sulphur, 50 lime, and 50 water.)

The product when filtered is a clear, reddish amber liquid, which chemically consists of calcium monosulphide, calcium polysulphide, calcium thiosulphate, and possibly small quantities of calcium sulphate. The amounts vary according to methods of preparation, the proportion of lime, sulphur, and water used, and the apparatus in which the material has been manufactured. The polysulphides alone possess fungicidal and insecticidal properties, consequently the worth of lime sulphur may be measured by the percentages of these ingredients present in the solution.

Unit of Measurement. (Three Methods Used.)

(1) *Specific Gravity.*—Ever since lime sulphur came into general use it has been customary to base dilutions on its specific gravity readings being given generally in

1932 CALENDAR 1932

MAY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	●	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	●
19	20	21	22	23	24	25
26	27	28	29	30	...	...
...	...	...	...	...	...	...

JULY

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	●	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	●	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	13	14	●	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	...

OCTOBER

S	M	T	W	T	F	S
30	31	...	...	...	...	1
2	3	4	5	6	7	8
9	10	11	12	13	●	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

NOVEMBER

S	M	T	W	T	F	S
...	...	1	2	3	4	5
6	7	8	9	10	11	12
●	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	8	9	10
11	12	●	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

1933 CALENDAR 1933

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	●	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

FEBRUARY

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	●	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	...	...	...	...
...	...	...	...	...	...	...

MARCH

S	M	T	W	T	F	S
...	...	...	1	2	3	4
5	6	7	8	9	10	11
●	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	...
...	...	...	...	...	...	...

APRIL

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	7	8
9	●	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	...	...	...	...	...	...

MAY

S	M	T	W	T	F	S
...	1	2	3	4	5	6
7	8	9	●	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	...	...	...
...	...	...	...	...	...	...

JUNE

S	M	T	W	T	F	S
...	...	...	...	1	2	3
4	5	6	7	●	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	...
...	...	...	...	...	...	...

JULY

S	M	T	W	T	F	S
...	...	...	...	...	...	1
2	3	4	5	6	●	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	...	...	...	...	...

AUGUST

S	M	T	W	T	F	S
...	...	1	2	3	4	5
●	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	...	...
...	...	...	...	...	...	...

SEPTEMBER

S	M	T	W	T	F	S
...	...	...	...	...	1	2
3	●	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
...	...	...	...	...	...	...

OCTOBER

S	M	T	W	T	F	S
1	2	3	●	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
...	...	...	...	...	...	...

NOVEMBER

S	M	T	W	T	F	S
...	...	...	1	●	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	...	...
...	...	...	...	...	...	...

DECEMBER

S	M	T	W	T	F	S
...	...	...	...	...	1	●
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	...	...	...	...	...	...

● FULLMOON.

degrees Beaume. That this is not a reliable indicator has been proved by many research workers, who have shown that there is no correlation between the specific gravity and the polysulphide content of the solution, and this is abundantly supported by the analysis conducted upon lime sulphur in New Zealand. A second disadvantage of such a unit of measurement is that the specific gravity may be affected materially by the addition of foreign substances of no value as fungicides or insecticides.

(2) In the United States of America, it is customary to express analysis of lime sulphur in terms of the total sulphur content, but this has been shown to be no index of the fungicidal value of a lime sulphur, as the sulphur compounds other than polysulphides have no toxic effect on fungi or insects.

(3) *Polysulphide Content.*—Research work has proved that the fungicidal and insecticidal value of lime sulphur is dependent on its polysulphide content, other ingredients present being of no value at the concentrations present.

According to Goodwin, Martin, and Salmon, the concentration of polysulphide is not affected by the base calcium, sodium, or barium employed. Such being the case, it is evident that these compounds form a reliable guide to the dilutions at which any particular make should be used.

Given the percentage of polysulphide present in any lime sulphur, it is evident from the table of dilutions supplied, an orchardist may easily arrive at the correct strength at which to apply the diluted spray.

A spray containing 1 per cent. is recommended for application during the period between dormancy and bud movement, 0.2 per cent. green tip to pre-pink, 0.1 per cent. for summer application, and 0.083 per cent. for autumn applications on apple varieties liable to spray burn, and for stone fruits.

Lime sulphurs fall into three groups.

(1) Lime sulphurs of this group possess a high polysulphide content, 16·19 per cent., a low calcium thiosulphate content, under 1 per cent., and are prepared by boiling under pressure in closed containers, consequently materials are not exposed to air during preparation.

(2) These contain a moderate polysulphide content (10·13 per cent.) and are prepared by the aid of steam in open vats exposed to the air.

(3) These contain a comparatively low polysulphide content (7·10 per cent., a relatively high thiosulphate content (1.75 to 3 per cent.), and are prepared by boiling over open fires in vats exposed to the air.

Variation in polysulphide content may be induced by altering the proportions of lime to sulphur, by increasing or decreasing the water content, by altering the time of boiling (45 minutes), or by using materials of varying degrees of purity.

The sediment formed during preparation of lime sulphur consists of calcium sulphate, calcium carbonate, free sulphur, and other impurities present in the ingredients. These residues are worthless as spray materials.

When a diluted solution of lime sulphur is applied to a tree, it undergoes certain chemical changes, with the result that ultimately only calcium carbonate, calcium sulphate, and free sulphur in a finely divided state remain. The polysulphides are converted into sulphur.

It is not known whether the polysulphides are directly fungicidal or whether lime sulphur acts on account of the free sulphur liberated as a result of its decomposition. It is probable that its fungicidal value over a period is due to this free sulphur, since this appears to be the only substance present upon the tree in addition to the inert materials mentioned.

It would appear that the insecticidal action of lime sulphur is due to (1) its power of absorbing oxygen (thus asphyxiating insects; (2) its ability to soften wax newly secreted on the margins of scales (thus tending to imprison the young by causing the scale cover to adhere firmly to the tree); (4) by the free sulphur which is liberated (known to possess a certain insecticidal value.)

As an ovicide lime sulphur appears to be of little value. This was also demonstrated by extensive experiments at the Blackwood Orchard. Action on plants—leaf scorch and fruit russet following summer applications of lime sulphur have been found to cause defoliation and dropping of young fruits. Numerous theories to account for this, but well summarised by Shoemaker who has grouped them under the following heads:—

(1) Injury due to the soluble polysulphides.
(2) Absorption of lime sulphur by the chlorophyll.
(3) To the effects upon the spray of sunlight, heat, gas, acids, and oxidation.
(4) To the minuteness of the sulphur particles deposited as a result of its decomposition.

It is certain that in many cases injury is due to a too great concentration at time of application owing to the practice of determining strength by the specific gravity of the solution.

Experiments have shown that lime sulphur diluted in accordance with its polysulphide contents will combat black spot and powdery mildew without appreciable injury to fruit or foliage. As a winer fungicide it has proved to be slightly inferior to fruit or foliage. As a winter fungicide it has proved to be slightly inferior to both Bordeaux and Burgundy against curl leaf of peaches.

It will hold red mite in check during summer by applications at 10 day intervals, but is not a satisfactory spray for this purpose. As a winter spray, it has failed to destroy red mite eggs, but has given satisfactory control against San Jose scale.

LENSWOOD AND FOREST RANGE (Average annual rainfall, 25in. to 36in.).

September 26th.—Present: 17 members.

Mr. R. Cramond read a paper on the soils of the district best suited to the growing of cherries. He stressed the necessity for a good location and subsoil, ensuring at all times proper drainage and shelter. He drew attention to the little that was known regarding suitable stocks for cherries. Cherries being self-sterile, needed other varieties to pollinate. Othere points referred to were pruning, spraying, and tillage.

Mr. G. Schult's (jun.) paper was on "Deciduous Fruits." He emphasised the importance of drainage and manure in apple cultivation, also naming the varieties most suitable to the district. Pears he did not favor for the hills; they were more easily and profitably grown in warmer districts.

Mr. K. Caldicott read a paper on "Berries." He did not think berry cultivation very profitable in the hills, although they were useful as a "fill gap" for the beginner. Strawberries were more profitable if well watered, otherwise only one crop was all that could be expected. Loganberries were unprofitable, because the supply exceeded the demand. Raspberries were becoming increasingly difficult to grow owing to the removal of so much native timber causing loss of shelter and cool atmosphere—so essential to raspberry cultivation. Gooseberries had been payable, but large areas recently planted were making it risky to depend on prices in the future. Speaking on "Stone Fruits," Mr. J. Vickers considered they were not profitable in this district unless grown to a large-sized fruit suitable for dessert. Prunes should be dried by the grower to be profitable. He thought there was a good opening for nectarines, because growers in the hills could produce them when others were finishing their supplies. (Secretary, B. Lawrance.)

NARRUNG.

September 3rd.—Present: 23 members.

Stabilisation of the Pig Industry.—The following points are taken from an address delivered by Mr. F. Ayres, who attended a conference to consider the above question. He outlined the expected legislation which would cover the proposals. The Act to be known as the "Pork Products Act." The suggestion was that a levy of 5s. be made on each bacon pig. The total levies for Australia would probably be in the vicinity of £250,000. At present the small surplus above local requirements governed the price of the whole production, and the scheme aimed at affecting the price of this exportable surplus in order to stabilise prices. The levy should raise the price of a pig by 8s. or 9s. It was shown that South Australian producers would benefit in the same proportion as those of other States. The proposed composition of the board to handle the scheme was a matter for serious consideration. This was expected to consist of five producers, four co-operative factories, four proprietary factories, four master butchers, and one Government representative. The control was obviously out of the producers' hands, and South Australia, contributing £21,000, would be represented by two-thirds of a delegate. The speaker believed that the scheme would benefit the industry, but considered that producers were entitled to greater representation on the board.

Fertilisers.—Meeting held October 4th. Present: 26 members. Mr. R. L. Griffiths (District Agricultural Instructor), in the course of an address on this subject, said owing to present economic conditions it was more important than ever that farmers should be efficient and get maximum production, and the greatest assistance towards that ideal would be given by the proper fertilisation of the soil. Only 5 per cent. of a plant structure came from the soil. To get reasonable growth, seven essentials—nitrogen, phosphorus, potash, lime, sulphur, magnesium, and iron—should be present in the soil. A chemical analysis of the soil was not always a reliable guide. The chemicals should be in a form possible of assimilation by growing plants. Researches at the Waite Institute had shown that manganese could play an important part; in certain soils it had improved yields to a surprising extent. It was not necessary to use sulphur as a direct fertiliser, because it was present in sufficient quantities in many commercial fertilisers. Lime was of great assistance in the growth of some plants. Lucerne and clover benefited by a proper proportion of lime in the soil. Where needed most, however, the great quantities required to be of any use made it difficult to use effectively. Practically all soils of Australia were deficient in phosphates and nitrogen. It should be realised that the use of phosphatic manures could be greatly extended and greater quantities used than previously. The whole of the superphosphate applied to the soil was available to plant life until all was used up. What was not used for one lot of growth was available to the next. A good pasturage could only be built up by the application of phosphates. Animals required the phosphate, and must get it from the pasture, and an improvement in the phosphatic content of the food improved the health and physique of stock. Nitrogenous fertilisers were now attracting a great deal of attention, and were expected to play a considerable part in the future of agriculture. The cheapest and best method of getting nitrogen into the soil was by increasing the growth of leguminous plants by the use of phosphates. The ideal pasture would be a mixture of grasses, together with legumes, and this could be controlled by using nitrogenous and phosphatic fertilisers at different times. Sulphate of ammonia was undoubtedly beneficial. It encouraged quick growth enabling plants to conquer drifts. Hay yields had been greatly increased by the use of this plant food. The results of experiments in green manuring were described. It had been proved that green crops first grazed and then ploughed in had been more profitable than a whole crop turned in. Animal manure had its uses, but could not supply all the needs of the soil.'' (Secretary, W. Lawrie, Point McLeay.)

October 25th.—Present: 30 members.

The danger of serious grass fires during summer was brought under notice, and after discussion it was decided that the matter should be given full attention and endeavors made to organise and prepare for the danger. The meeting also discussed pleuro-pneumonia, an outbreak of which had occurred in one of the local dairying herds. (Secretary, W. Lawrie.)

STRATHALBYN (Average annual rainfall, 19.35in.).

October 5th.

Reports of Congress were given by Messrs. Collett and Pearce.

Horses and Their Treatment.—The following paper was read by Mr. S. Bottrill:—''While thousands of horses receive the best of care and attention there are many that are sadly neglected and ill-treated. Great advancement has been made in agriculture with experts in all its branches to give advice, while the horse, which is the most faithful, intelligent, and useful of all animals, is sadly neglected, and much of the hardship and cruelty that he is subjected to is caused through ignorance. Many of the present-day drivers could well go back 80 years and take lessons from their great grandfathers. It is high time that some step was taken to educate our young people. We often notice a young man driving two horses in a van, with one hand jerking the reins, and the other plying the whip, so that the poor brutes are kept in constant torture, and yet this sort of thing is allowed to pass unnoticed, while a man found working a horse with a sore shoulder is pulled up and fined. The S.P.C.A. has been doing a noble work in relieving suffering, as thousands of dumb animals could testify. The Society has fully justified its existence. What is needed is more honorary inspectors in different parts of the State, with power to caution, or if necessary report cases of cruelty. There are many ways in which the life of a horse can be made more endurable. Drive the team by words instead of jerking with the reins; the driver who keeps up a constant growl and 'click! click!' to his team has very little control over them. Horses have more intelligence than we give them credit for. In my young days I drove teams of horses for years without using reins on them. To-day horse driving seems to consist of pulling on the reins with no kind or commanding word. As a rule sore shoulders are the result of carelessness and neglect; with well-fitting, clean collars on clean shoulders there should be but little trouble with sores; horses with sores should not be spelled unless they are very bad, seeing that after a spell they are the most liable to get sores. A newly-shorn sheep pelt, with the wool side to the collar is much better on a sore than the ordinary collar lining, because it is easy to keep clean. Lard and sulphur, white lead and olive oil are good for sore shoulders. One of the chief causes of sore shoulders is working without backbands; when we see a team of horses with a load of heavy swings that drag the collars down on the points of the shoulder and pinches the top of the neck, it is no wonder that sore shoulders develop. Back-bands, kept well oiled, will last for over 20 years, and with a side of leather and a few copper rivets they are easily made. I have always used back-bands, and during the 70 years that I have been driving teams I have had but little trouble with sore shoulders. *Colt Breaking*: The first lesson to teach a colt is to let you approach him without fear of being hurt. I have always adopted the method of using first a long light stick, then a shorter one, and rubbing the colt all over, then with the hand until a rope or head-stall can be put on, it is far better than the crush pen or head roping, in either case the colt starts to fight. Patience, firmness, and kindness are needed. The colt should be handled from his nose to his toes the first day; do not take a horse to the blacksmith's to be shod before his legs and feet have been handled, the smith's work is to shoe horses, not to break them in. I do not favor handling foals or breaking horses to lead and tie up; when buying colts I would give a pound or two more for one that had never had a hand on than for one broken to lead and tie up; I speak from experience, having had so much trouble with pets and half broken ones. When handling a colt, see that the ropes get well between his hind legs to save trouble later on when he gets his legs over the chains. When putting a colt between other horses, it is a good plan to put a breeching on him, with the straps fixed to the other horses' collars, this will prevent him running back and pulling the others with him. The saddle horse should be taught to stand while the rider mounts and dismounts, and a stock whip should be used on him the first time he is ridden. Colt breaking is a very interesting job, and time well spent. See that the horses' tails are kept nicely trimmed, so that they are a thing of beauty, while big bushy or 'banged' ones are neither use nor ornament. When the team comes in from work, see that they have the chance of a drink and a roll before being fed. Treat horses well and they will give you good service.'' (Secretary, F. Allison.)

THE REAL PROPERTY ACT.

A paper read by Mr. C. Kightley at the September meeting of the Hindmarsh Island Branch.—''In order to appreciate the vast change which the Real Property Act made, it is necessary to know how title to real property was established under the general law, or, as it is commonly called, 'the old system.' In theory no person can own real estate. The King is the absolute owner, and all we can own is an estate in the land. At the formation of the colony anyone desiring to own land would apply at the proper Government Office, and in return for the price paid a grant of a block of land would be given from His Majesty through his representative, the Governor. That grant was the title to the land described therein. If that person desired to sell that land, he would execute the necessary deeds and hand them over, together with the grant, to his purchaser. Each time the land changed hands the same procedure would take place, and so with every transaction, were it a will, settlement, a death, or any legal circumstance, the necessary deeds and legal proof had to be kept to show the link of title. When many years had passed one can imagine the number of legal documents that would accrue if a property changed hands many times. Under this system title to land depended entirely on the legality of every deed in your possession. If anyone of them was bad in law, the whole title was bad. If a person in possession of these deeds desired to sell the land comprised in them, the solicitor for the purchaser would carefully scrutinise every deed to see if it were good. He would, with great care, see that every link was established right back to the original grant, which took considerable time. Suppose the new purchaser desired to sell, or raise money on mortgage. The Solicitor for the contracting party would again do as the previous solicitor had done. Every time a dealing was contemplated this retrospective examination of title was necessary. This extracting of title was very important, and to give you some idea of it Preston's work, edited in 1823, devotes 1,300 pages to that subject alone. It was necessarily a costly procedure, and in 1828, in England, a commission inquiring into the question of land title reform discovered in one case where a piece of land of 1,460 acres was sold, the costs for obtaining title and settlement was £2,500. In 1852, in England, Lord Cairns said: 'If land of any value was sold some 12 months elapsed before settlement could be reached and title proved.' Messrs. Duffy & Eagleson —noted Australian lawyers—in their work on the Torrens System, say, 'The old system of conveyancing was responsible for great delay, expense, and uncertainty. It led to elaborately planned concealments extending over generations. Add to this the lengthy recitals, its formality of seal and delivery, the doctrine of constructive notices, the technicalities of the wording, the shadowy equities born of fraud and fear haunting the most perfect conveyance, the subtleties of the judicial amendments and repeals of the statute of uses, receipts for consideration sacrilegiously omitted from the indorsement of a deed—add to these and it is not difficult to sustain the proposition that reform was desirable,' The reform came in South Australia on July 1st, 1858. It abolished the necessity for all the deeds mentioned and substituted one piece of paper called a 'certificate of title,' which did for all time, for all people, and for all transactions connected with the land described therein. Above all, the certificate of title is a Government guarantee—with a few exceptions—that a title is good. Instead of figuratively handing over a host of deeds of doubtful legality, the State steps in and puts all doubts at rest. If John Jones is named on the Certificate of Title as owner, there is no need to go behind that statement. Every time that property is dealt with the Registrar-General endorses the nature of the transaction on this certificate, and anyone at a minute's glance can see what encumbrances exist. In four days the transaction can be finalised by registration. The old antiquated system was in operation for about 22 years in South Australia, and several people during that period had voiced popular opinion in the press on the need for reform. Finally a Bill was prepared and became law. It is extremely difficult to say who first initiated the proceedings, but Mr. Torrens, who was a member of the House of Assembly, later the first Registrar-General, had the business acumen and necessary strong conviction to produce, and get finally passed, the measure that has proved a boon to many millions of people, and which fittingly bears his name. However, he received wonderful support from Dr. Hubbe, a doctor of laws from Germany, who translated the Hanseatic land laws for Mr. Torrens. The South Australian Act was followed in all the Australian States and in New Zealand, and, finally, in many parts of the world. It is a source of pride to us that we should show the way to our Mother Country in the way of this legislation. Some salient features of the Act.—The fundamental principle is to give an indefeasible title—with a few exceptions—and to provide that title to land shall be evidenced by registration and not by deed. The title cannot be defeated. Once your name is shown as owning the land you can, by the simple forms specified in the Statute, create interests. There is no need to go behind the certificate of title to discover if the person named therein relies on a valid document. There is no retrospective examination needed. Under the general law the possibility of the title being defeated could not be entirely excluded, though the Registration of Deeds Act, 1841, gave some security from suppressed documents. Under the Torrens system defeasance—with exceptions—is impossible, hence absolute confidence is established when dealing. Second in importance is the requirements of registration, for which see section 67 of the Act. Title is obtained only on registration. If one deals with a registered proprietor, and has obtained a document from him executed in the manner and according to the requirements of the Act, and put that in your office safe you do not get any legal title. You must register the instrument to get in the legal estate, or else you may find the equity postponed to a subsequent equity if certain steps are not taken to protect it. Third—The impossibility of adverse possession affecting the title is another worthy attribute of the Act. The owner of land in a certificate of title may leave the country and forget all about the land, and yet no one can obtain any title to it adversely. However, if a person leaves the State he should pay the rates and taxes, for, in certain cases the land may be sold under other statutory powers for arrears. Under the old system a title to land could be obtained under the Statute of Limitations—not so under the Real Property Act. Forth, the non-notation of trusts on the certificate of title is an outstanding feature. Every registered proprietor can confer title on someone else. In whatever manner his powers may be limited under a trust deed, the Real Property Act gives him all the attributes of an absolute owner, and, in spite of any breach of trust, a third party acquiring *bona fide* and for value obtains a good title. Though the registration of trusts on certificates of title is forbidden, it is not to be inferred that equities generally are abolished. If there is any equitable interests it is desired to protect, the Act provides the machinery in the form of a caveat. This acts, when registered, as notice to all the world, and the Registrar-General will not register on that certificate of title anything contrary to the requirements of the caveat whilst the same remains in force. The establishing title is a simple process, but like many other simple things, there is danger if unskilled hands are employed. Behind the Real Property Act —which is only a measure to secure title—stands the whole body of real property law. I strongly advise anyone who attempts any transaction to obtain the services of the legal practitioner or a licensed land broker. The charges are moderate and well worth the excellent services rendered. Searching the certificate of title.—It is a fundamental of the Torrens Statutes, and laid down also by all superior courts, that the story told by the certificate of title (original) can be relied on absolutely, considering that you have to a certain extent a fiduciary relationship to your fellow citizen. Any person who contemplates a dealing under the Real Property Act is advised to search the certificate of title. This is of paramount importance, and is, unfortunately, often overlooked. The duplicate certificate of title which may be exhibited does not necessarily contain all registrations. As an example, if 'A,' under an agreement sells his land to 'B,' 'B' will, through his adviser, register a caveat on 'A's' certificate of title, not on the duplicate in 'A's' possession. 'A,' who is unscrupulous, shows this duplicate certificate of title to 'C,' and offers the land therein at a price to suit 'C.' Without searching the original certificate of title 'C' settles with 'A,' who immediately absconds. When 'C' attempts to register his transfer the news of the caveat reaches him. Conversely, suppose 'B' buys under an agreement from 'A,' and negligently omits to protect equity by the registration of the caveat, 'A' subsequently offers the land to 'C,' who, on searching the certificate of title (original) and finding all clear, settles with 'A' and obtains a transfer from him. In these circumstances 'C's' equity, though subsequent, will prevail and entitle him to registration. Cases are not always as simple as these and are not frequent, but these illustrations are cited to show that although the Act is very simple yet it is absolutely necessary both to search the original certificate of title and to register the transactions. General administration of the Real Property Act.—Like the Rock of Gibralter in defence stands the assurance fund, the total of which is now some £180,000. It was established for the purpose of giving compensation to anyone deprived of land through fraud, &c. It is a safeguard to the public and creates confidence how the Act is administered by the Registrar-General, his deputies and staff, all of whom must be specialists in their particular duties. Many of the officers have spent the best part of their lives in certain branches of the department, and are highly qualified—having been trained in the office practice from boyhood. In one branch of the office where the actual registrations are effected there are no less than 220 different forms used. The treatment of documents under the Act can be explained by taking the case of a simple transfer, which is as follows:—Assuming a party has searched the original certificate of title and finding everything in order, he completes the purchase of a property. The transfer having been signed and the requisite stamp duty affixed, it is produced at the public office of the Lands Titles Department. The fee is assessed by a clerk who notes the date and hour of production thereon. The transfer is then passed through a cash register, and a receipt is handed to the party producing the transfer, who is told to call in four or five days, when the title will be completed in the name of the new owner. The transfer is next numbered and indexed, and within an hour or so of its presentation at the office a memorandum of it is noted on the certificate of title concerned. This preserves its place on that certificate, acts as notice to the public searcher as well as to the office, and avoids any mistakes in registration. It is an excellent provision, and is quite a recent innovation. The transfer is next examined by the draftsman as to the description of the land, and then by one of the deputies, who sees that it is drawn in the way prescribed by the Real Property Act. It is then indorsed on the original and duplicate certificates of title, signed by the Registrar-General, and the duplicate certificate is delivered back to the party who originally produced the transfer for registration. Since the inception of the first Real Property Act some 1,300,000 such documents have been registered, and any of these can be inspected on the payment of 3s.''

[*The writer acknowledges assistance to Mr. G. A. Jessup (A.C.U.A., Deputy Registrar-General of Deeds) in the compilation of the paper.*—Ed.]

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Springton	9/11/32	9	Annual Meeting	E. Brokate
Blackwood	14/11/32	11	Address—R. Fowler	H. Goldsack
Macclesfield	17/11/32	22	Address—H. J. Apps	H. Ross
Balhannah	4/11/32	14	" Worlds Economics," M. Cameron	C. Grasby
Balhannah	14/11/32	11	Address—C. Goddard	C. Grasby
Mt. Pleasant	16/11/32	9	Address—C. Goddard	D. Smith
Cherry Gardens	12/11/32	15 and 100 visitors	Annual Social	A. Stone
Myponga	22/9/32	19 and 12 visitors	" Grasses," R. Magor	C. Martin
Milang	19/10/32	7	Address—C. Goddard	L. Yelland
Monarto South.	20/8/32	18	" Superphosphate," W. Giles	C. Altmann
Blackheath	20/10/32	9	Congress Reports	E. Paech
Langhorne's Creek	19/10/32	9	Paper from *Journal*	P. Nurse
Myponga	20/10/32	16 and 20 visitors	Address—C. H. Beaumont	C. Martin
Monarto South.	15/10/32	12	" Sport," B. Schenscher	C. Altmann
Hope Forest	7/11/32	12 and 15 visitors	Formal	E. Muldoon
Shoal Bay	11/11/32	7	Discussion	E. Bell
Mt. Compass	3/11/32	45	Field Day	C. Verco
Jervois	10/11/32	24	" Book-keeping," Mr. McConnell	T. Baily
Blackheath	7/11/32	7	Paper from *Journal*	E. Paech
Mt. Barker	31/10/32	—	Address—H. B. Barlow	P. Wise
Mt. Barker	21/11/32	—	Address—R. Hill	P. Wise
Narrung	5/11/32	20	"Fire Control Arrangements	W. Lawrie

CROWN LANDS.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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S. R. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

South-East, at Penola, Wednesday, March 8th.

Mid North, at Gladstone, Wednesday, March 15th. (Secretary, Mr. L. J. Sargent, Gladstone.)

Yorke Peninsula, at Stansbury (Weavers Branch), Wednesday, March 22nd. (Secretary, Mr. H. W. Cornish, Stansbury.)

South-East, at Bordertown (Tatiara Branch), Wednesday, April 5th. (Secretary, Mr. L. H. Butler, Bordertown.)

Dairying.—At Mount Barker, Thursday, May 11th (Secretary, Mr. P. Wise).

Each Conference will be opened at 10.30 a.m.

Pig Breeders and Raisers' Association.

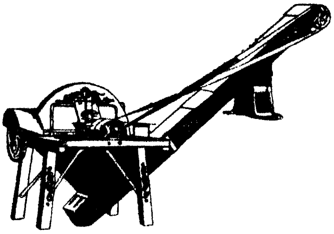
The Secretary of the Pig Breeders and Raisers' Association of South Australia has announced that at a recent meeting of that body it was decided to reduce the rate of subscription from 10s. 6d. to 2s. 6d.

Vitamin Content of Australian Butter.

The details and results of a scientific investigation (made possible through the aid of the Empire Marketing Board) on the vitamin value of Australian and New Zealand butter are available in a report issued by the Medical Research Council. The findings in this report should do much to increase the sale of Australian butter in the United Kingdom. The prominence given to-day to food values and the vitamin contents of foodstuffs coupled with the fact that Britain must obtain some of her supplies from overseas, emphasises the importance of knowing that those which come from far-distant dominions can be accepted alongside the best that can be produced in England. This especially affects butter which possesses the two fat-soluble vitamins—A and D. Vitamin A is essential to growth and helps resistance to disease, whilst Vitamin D (the rickets-preventing factor) is necessary for the formation of strong bone and good teeth. The butters tested in the investigation were subjected to a rigid examination, beginning with the study of the cows supplying the cream, of the conditions under which they have been living, of the treatment of the cream and details of every process involved from the time when the butter left the farms in the Dominion until its arrival in England. To estimate the vitamin content tests were made with rats. Two groups were used, the members of one being fed on an ordinary diet, the others receiving food from which Vitamin A had been excluded. The rats on the restricted diet lost their glossy coats; their energy and their weight declined; some even developed disease. Their impoverished condition was arrested by daily doses of butter, and the ailing animals began to put on weight and to recover their spirits. Experiments were also carried out which demonstrated the presence of Vitamin D and its necessity to the healthy life of the rats.

The vitamins in the butters were also found to have remarkable stability during cold storage. The value of the vitamin content was tested soon after the butters arrived in England. The results were considered, together with the information given about the state of the butters when they were first graded and packed, and no appreciable difference in the vitamin potency of the samples was found to exist. The same butters were tested after they had been in cold storage for at least two years, and even after

3 WINNERS for 1933



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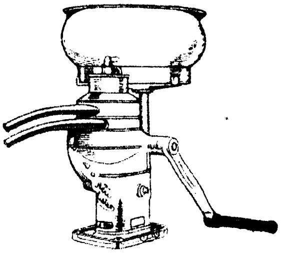

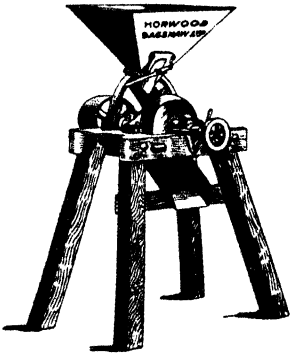

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that length of time the general conclusion was justified that no notable depreciation of food value had taken place. These experiments—so satisfactory in their results—demonstrate clearly that the Australian butters suffer no ill effects during the two or three months which customarily elapse between the time of their production and of their consumption.

Herd Testing—Increase in Fees.

A few months ago over 40 breeders of pure-bred cows applied to have their cows tested, but owing to the high cost of doing the work, the Department of Agriculture was unable to accept the applications unless all breeders (including 50 already participating in the scheme) were prepared to pay higher fees than those at present in force. The following new schedule of fees has been drawn up and will operate as from July 1, 1933:—

1. An annual herd entrance fee of £6 10s. per herd.
2. A testing fee of 10s. per lactation.
3. Ten (10) cows per herd to be the smallest number acceptable for test, except in instances where smaller herds can be tested in pairs by the same official tester on the same day.
4. The minimum herd entry fee, plus testing fee, will be:—For a herd of 10 cows or more, £11 10s., and for a herd of less than 10 cows (tested in pairs), £8 10s. per herd.
5. A levy of 15 per cent. on the selling prices of all bulls sold under subsidy will be collected from the sellers and paid into the Treasury.

Amended rules will shortly be prepared by the Department of Agriculture, and will then be ready for circulation.

Gauges for Export Apples.

At the Tanunda Conference of the Agricultural Bureau, held in November last, a discussion arose on the question of the accuracy of gauges for sizing export apples. In a recent interview Mr. Geo. Quinn (Chief Horticultural Instructor) pointed out that District Horticultural Instructors were supplied with gauges of the correct dimensions, and that growers or packers who desired to check gauges purchased from manufacturers could confer with District Instructors or take the gauges to the office of the Horticultural Division of the Department of Agriculture, Exhibition Building, North Terrace, Adelaide, for comparison with the standard sizes.

S.A. Eucalypts for Sardinia.

The Deputy Director of Agriculture (Mr. W. J. Spafford) is arranging for the despatch of 10 varieties of seeds of South Australian Eucalypts to the Island of Sardinia. These are being forwarded in answer to a request, and will be planted in the grounds of some of the Agricultural Schools in Sardinia.

Publications Received.

"Asparagus" Bulletin No. 60, Ministry of Agriculture, England. Price 1s. net.

AGRICULTURAL INQUIRIES.

[*Replies supplied by Mr. W. J. Spafford (Deputy Director of Agriculture).*]

Crop Rotation.

Brentwood Branch of the Agricultural Bureau: *"If wheat is grown after oats, which practice would give the better wheat crop—(a) to graze the oats right down in September and then spring-fallow the land; or (b) cut the oats for hay and prepare the land in the autumn immediately before seeding with wheat?"*

Reply—In most seasons grazing off the oat crop and immediately fallowing the land will result in much better results from the wheat crop that follows than will autumn ploughing after the oat crop has been cut for hay. To get full results from spring fallow it is essential to avoid over-loosening the soil, and wherever possible to do a good job, fallowing with a rigid-tined cultivator is better than using the plough. If the work is done with a plough an attempt should be made to plough to a depth not exceeding 2in., but if for any reason this depth must be exceeded, the land should be packed together with a roller or culti-packer as soon after ploughing as is possible. As a rolled surface should not be left in spring, the implement used for packing the land should be followed by a cultivator or harrows.

Poisoning Rabbits.

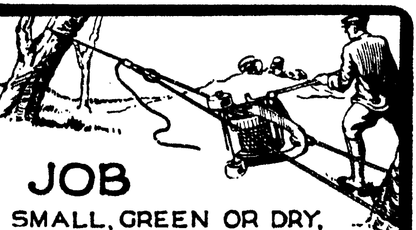
G. H. M., Younghusband, reports that he has not been successful in poisoning rabbits with a commercial poison containing phosphorus, and would like to use strychnine. How is the latter poison used?

Reply—Strychnine is generally used on baits made by cutting up apples, carrots, thistle roots, or other fresh vegetable growths, into small pieces. The strychnine is ground to a powder as fine as flour, and sprinkled on the baits at the rate of about 1oz. to about 15lbs. of baits. The baits are usually laid in shallow trenches. Strychnine can also be used to poison water for the eradication of rabbits where watering places are few. A third of a pint of acetic acid will dissolve 1oz. of strychnine, and this should then be added to about 12galls. of water.

Cultivation of Fallowed Land.

The Millendilla Branch of the Agricultural Bureau: "What is the best treatment for land that was fallowed in June of last year and cultivated in September, but could not be given any further working, because of hay making operations."

Reply—The method of working this fallowed land will depend upon whether it has set together or is weedy, but whatever is done, the soil must not be loosened to an excessive degree. The sooner the land is cultivated in some way the better, but if it is necessary to rip it up to too great a depth, it should be immediately rolled and again cultivated or harrowed. If rain falls before the cultivation, the work can be done to a shallow depth, but this is harder to control if it is necessary to work the land when dry. In a general way it can be advised that the land should be cultivated soon, but must be compacted together in some way before seeding is commenced.



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Summer Crops for Maitland.

Maitland writes: "I am prepared to set aside 15 *acres of fallow to lay down a pasture to provide feed during summer for stud ewes and lambs. What is the best fodder to grow for this purpose?"*

Reply—I know of no pasture crop likely to give results equal to lucerne, if grown as a grazing crop in summer in the Maitland district. Even though the crop is not irrigated it will give good grazing results in your conditions if handled in a proper manner. The area sown to lucerne should be enclosed by fences. No one has succeeded in establishing 10 acres of lucerne in a 100-acre field. The seed, at the rate of 8lbs. to 10lbs. per acre, should be sown on fallowed land during April or May, when the soil is moist enough to be in good germinating condition. The seed should be mixed with superphosphate and be drilled in at a shallow depth. 2cwts. superphosphate per acre is warranted. Each winter the lucerne field should be well cultivated, and 1cwt. superphosphate, drilled in, to the acre. Lucerne stands receiving good treatment, should last about five or six years before they become so thin as to be unprofitable.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

"Marama" reports horse which swells along belly and sheath.

Reply—This condition is due to defective heart action and not to the presence of worms, and there is no treatment which will be of much value except temporarily. Powdered nux vomica (flat teaspoonful doses) can be given mixed in the food twice a day for 10 days, and if the animal has to be worked it should be only light in character.

Rockleigh reports: 1. *Jersey heifer (calved about seven days) with swollen udder and part of belly.*

Reply—This is not an uncommon condition and is due to congestion of the udder. It is not a diseased condition and will clear up in from 10 to 14 days. Fomenting the udder with hot water for 10 minutes at a time prior to milking should be carried out, and then the udder should be gently but firmly massaged by rubbing in a little camphorated oil. The administration of 1lb. of Epsom salts with 2ozs. of ginger in 2 pints of water and ½lb. of treacle is also recommended.

2. *Heifer calf, about* 14 *days old, which only drinks a little milk and grinds its teeth.*

Reply—A calf about 4 days after birth should receive approximately 1lb. of milk for every 8lbs. to 10lbs. the calf weighs. Thus a calf weighing 60lbs. would receive every 24 hours 6lbs. to 8lbs. of milk, which should be divided into 2 or 3 feeds. At 3 weeks old feeding twice a day is sufficient, and if the milk supplied is rich in cream, add a proportion of sweet separated milk to reduce the richness. It is possible that the calf may be constipated, and if such is the case, give her as a drench 1 tablespoonful of castor oil mixed with a little milk at blood temperature. The calf should also have access to a little good quality hay, especially clover hay.

Marama reports death of sheep—pink eyes and quite blind.

Reply—The disease is pink-eye. Pink-eye is a highly contagious disease. Isolate affected sheep in a small paddock where there is plenty of water (and shade if possible). Hand-feed. Treat by putting a few (3 or 4) drops of a 5 per cent. solution of zinc sulphate (buy 8ozs.) in the affected eyes daily.

Manoora has pigs weak behind shoulder.

Reply—Give the young pigs plenty of exercise and a good ration of skim milk. Supplement the oats (which should always be fed crushed) with a ration of barley. For the affected pigs you should try to get a ration of green feed (lucerne) daily. Further, give each pig 1 dessertspoonful of meat meal daily or else a boiled rabbit occasionally. Supply the following lick to your pigs:—Wood charcoal (crushed), 2 parts; sterilised sweet ground bonemeal, 1 part.

Mindarie reports pigs, about 70lbs., lost use of hind legs.

Reply—The condition is a dietetic one. The pigs should be given fresh whole milk for 7 to 10 days, plus a liberal supply of green lucerne (if possible) or other green stuff. Put out in open so that they can have plenty of exercise. Further, give a good ration of meat in form of meat meal (1 teaspoonful daily per pig) or else cooked rabbits.

Marama has gelding 20 years old, on moving about urine runs away.

Reply—If urine dribbled away a calculus may be present; in this case no treatment can be suggested. Try the following:—Withdraw the penis from the sheath and wash and clean out the sheath and penis. After doing this smear with castor oil. Further give this medicinal treatment:—(*a*) Give the following powder every 4 hours in the drinking water (water from bucket) for 2 days: Bicarbonate of soda, 6 teaspoonsful; potassium acetate, 6 teaspoonfuls. (*b*) Give 1 teaspoonful of powdered nux vomica night and morning for 14 days. To give, mix with treacle and smear on tongue.

Wepowie reports horse with girth gall.

Reply—Put the horse out of work. Clip hair from around girth gall, wash area with warm water and soap, dry and paint with tr. iodine for 2 or 3 days. Subsequently dress daily with carbolised vaseline. The girth gall is probably due to the horse being "out of condition."

Wirrulla asks why well nourished, heavy milking cows are particularly subject to milk fever?

Reply—Milk fever is due to a pronounced fall in the amount of calcium in the blood. Milk (and especially colostrum) are rich in calcium. The bigger the milkers the heavier is the sudden withdrawal of calcium from the blood, and once a certain mark in the calcium content of the blood is passed the disease occurs.

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TENTH AND CONCLUDING REPORT ON THE TURRETFIELD DEMONSTRATION FARM (1921-32) INCLUDING DETAILED ANALYSIS OF MEAN FARMING COSTS OVER THE SAME PERIOD.

[By ARTHUR J. PERKINS, Director of Agriculture.]

(*Continued from page* 644.)

PART II.—*continued.*

COSTS OF A FAT LAMB FLOCK.

1. GENERAL.

The Turretfield Flock has within recent years consisted of Merino Ewes from which Fat Lambs have been bred by Rams of English Short Wool Breeds. The number of ewes put to the rams in each successive season has been as follows:—

	Ewes.		Ewes.
1922–23	429	1927–28	774
1923–24	458	1928–29	724
1924–25	530	1929–30	678
1925–26	637	1930–31	666
1926–27	683	1931–32	625
1922–32 Mean			620

The Opening Flock Inventory (April 1st, 1922) and the Closing Flock Inventory (March 31st, 1932), together with the Mean Inventory for the 10 seasons, are shown below in Table XXXII.:—

TABLE XXXII.

Showing Opening (1/4/22) *and Closing* (31/3/32) *Flock Inventories, together with Mean Flock Inventory for the* 10 *Seasons* (1922-32).

	Opening Inventory (April 1st, 1922).		Mean of Eleven Inventories (1922-32)		Closing Inventory (March 31st, 1932).	
	Nos.	Values.	Nos.	Values.	Nos.	Values.
		£ *s.* *d.*		£ *s.* *d.*		£ *s.* *d.*
Rams	32	51 10 0	18	50 6 4	13	53 0 0
Ewes	449	347 5 0	624	804 2 7	572	508 12 0
Hoggets	36	27 0 0	76	67 14 6	21	10 10 0
Rations	11	6 12 0	7	7 5 5	—	—
Totals	528	432 7 0	725	929 8 10	606	572 2 0
Mean Value per Head	16s. 5d.		25s. 8d.		18s. 11d.	

The preceding figures show that taking 11 Inventories into consideration, starting with the opening Inventory of 1922 and closing with the closing Inventory of 1932, the Turretfield Flock—apart from Lambs, which would be sold between opening and closing Inventories of each year—has consisted of 725 head valued at £929 8s. 10d., or 25s. 8d. per head. This period includes 1929-30, when the price of Sheep, in sympathy with that of wool, fell very heavily. On the other hand, Sheep were valued at 16s. 5d. in 1922 and at 18s. 11d. in 1932.

Flock Mortality during these 10 seasons (1922-32) was at the following mean rate per annum:—

	Total Losses. Nos.	Percentage Losses. %
Ewes	38	6·2
Lambs	17	3·5
Rams	2	16·5
Totals	57	5·0

Hence, during these 10 seasons Mean Yearly Flock Losses from accident or disease were 57 head, or 5 per cent. of the total number present.

2. Flock Expenditure.

Mean Expenditure per annum incurred in the handling of a Fat Lamb Flock over a period of 10 years (1922-32) has been summarised in Table XXXIII.

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TABLE XXXIII.—*Detailed Analysis of Mean Yearly Cost of a Fat Lamb Flock* (1922-32).

	Labor.	Horses.	Implements.	Materials.	Miscellaneous	Totals for 620 Ewes.	Costs per Ewe.	Percentages.
	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	*s.* *d.*	%
A. Tending Flock—								
1. Tailing	2 1 7	0 1 3	0 0 1	—	—	2 2 11	0 0·8	0·27
2. Dipping	2 11 2	0 4 7	1 17 1	3 3 9	—	7 16 7	0 3·0	0·99
3. Shearing	35 2 1	0 0 11	0 4 1	6 2 3	0 8 7	41 17 11	1 4·2	5·28
4. Various	86 18 1	5 4 3	1 17 5	—	0 0 9	94 0 6	3 0·4	11·84
Totals	126 12 11	5 11 0	3 18 8	9 6 0	0 9 4	145 17 11	4 8·4	18·38
B. Feed—								
1. Non-arable pasture	1 3 4	1 2 5	0 16 5	7 15 3	43 11 9	54 9 2	1 9·1	6·86
2. Temporary arable pasture	0 6 7	0 5 7	0 4 2	2 0 3	185 17 0	188 13 7	6 1·0	23·77
3. Feeding off of Crops	—	—	—	—	9 15 2	9 15 2	0 3·8	1·23
4. Grazing Crops	7 1 9	12 13 4	3 19 5	37 5 1	44 1 8	105 1 3	3 4·6	13·23
5. Hand feeding	7 3 11	2 0 2	5 16 7	80 2 3	—	95 2 11	3 0·8	11·99
6. Water	—	—	—	6 10 10	—	6 10 10	0 2·5	0·82
Totals	15 15 7	16 1 6	10 16 7	133 13 8	283 5 7	459 12 11	14 9·8	57·90
C. Marketing—								
1. Wool	1 9 6	0 14 1	0 1 9	—	3 7 6	5 12 10	0 2·2	0·71
2. Sheep and Lambs	5 8 0	1 0 9	0 1 1	—	17 2 2	23 12 0	0 9·1	2·97
Totals	6 17 6	1 14 10	0 2 10	—	20 9 8	29 4 10	0 11·3	3·68
D. Incidentals—								
1. Sundry Stores	—	—	—	0 10 0	—	0 10 0	0 0·2	0·06
2. Rates and taxes	—	—	—	—	21 19 1	21 19 1	0 8·5	2·76
3. Interest on Floating Capital	—	—	—	—	42 12 5	42 12 5	1 4·5	5·37
4. Interest on Overdraft	—	—	—	—	5 18 10	5 18 10	0 2·3	0·75
5. General Expenses	43 18 4	1 19 4	2 15 0	—	39 9 7	88 2 3	2 10·1	11·10
Totals	43 18 4	1 19 4	2 15 0	0 10 0	109 19 11	159 2 7	5 1·6	20·04
Grand Totals	193 4 4	25 6 8	17 13 1	143 9 8	414 4 6	793 18 3	—	—
Totals per Ewe	0 6 2·7	0 0 9·8	0 0 6·8	0 4 7·5	0 13 4·3	—	25 7·1	—
Percentages	24·34	3·19	2·22	18·07	52·18	—	—	100·00

Table XXXIII. shows that on the basis of the Mean Number of Ewes put to the Rams in 10 successive seasons, the Mean Costs of Handling a Fat Lamb Flock, including Marketing Costs, have aggregated 25s. 7d. per Ewe. In these Costs 6s. 3d., or 24.34 per cent. has been absorbed by wages; 14s. 10d., or 57.98 per cent. by Feed; 5s. 2d., or 20.04 per cent. by Incidentals; and 11d., or 3.68 per cent. by Marketing.

Under "Feed," six items have been given, namely—

1. Ordinary non-arable Pasture grazing, the value of which is determined by the rental value of the land, plus whatever improvements—such as top-dressing—that may have been carried out during the season.
2. The grazing of arable land temporarily out of cultivation, the value of which has been determined by the rental value of the land whilst out of cultivation.
3. The feeding-off of rank crops, the value of which is determined upon an agistment basis.
4. The grazing of specially sown grazing crops, the value of which is determined by actual costs incurred in putting in the crop, plus the rental value of the land.
5. Hand-feeding, the value of which is determined by the costs of the foodstuffs and of their distribution.
6. Water charged at actual costs.

Whenever Livestock other than Sheep have had access to pastures or grazing crops costs have been apportioned on the basis of one Horse being the grazing equivalent of nine Sheep, and one Cow of seven Sheep.

It will be observed that in these "Costs" no place has been found for Flock Depreciation, which would include progressive depreciation of Breeding Ewes and Rams, and losses from disease or accident. Unfortunately, it is extremely difficult to place an accurate figure on depreciation, unless one overlooks altogether Market Fluctuations; in a Fat Lamb Flock, Ewes that have dropped two or three Lambs are usually fattened off and sold, and when markets are favorable may at times realise even more than their original purchase price. Hence, in order to avoid these difficulties Depreciation has been included in Inventory Differences, which are taken into account when Flock Revenues are taken into consideration.

Data given in Table XXXIII. have been summarised under the usual statements "A," "B," and "C," as follows:—

TABLE XXXIV.

Summarised Statements of Mean Costs of a Fat Lamb Flock under Statements "A" and "B"; and of Inclusive Costs under Statement "C".

	Mean 1922-32 "Costs."	
	Per Ewe.	Percentages.
STATEMENT "A"—	*s. d.*	
Tending Flock	4 8	18·4
Grazing	11 7	45·1
Hand Feeding	3 1	12·0
Water	0 2	0·8
Marketing	0 11	3·7
Incidentals	5 2	20·0
Total Costs	25 7	100·0

TABLE XXXIV.—*continued.*

	Mean 1922-33 " Costs."	
	Per Ewe.	Percentages.
STATEMENT " B "—	*s.* *d.*	%
Labor (direct and indirect)	6 5	25·1
Use of Horses	0 8	2·6
Use of Implements	0 6	2·0
Foodstuffs	2 7	10·1
Purchase of Materials other than Foodstuffs	2 1	8·1
Freight	0 8	2·6
Balance of Expenditure	12 8	49·5
Total Costs	25 7	100·0

		In Terms of "A" & " B."	In Terms of Inclusive Expenditure.
STATEMENT " C "—		%	%
Interest on Land and Improvements	9 2	35·8	25·7
Interest on Floating Capital	1 5	5·5	4·0
Interest on Overdraft	0 2	0·7	0·5
Depreciation of Improvements and Plant	1 6	5·9	4·2
Interest and Depreciation Charges	12 3	47·9	34·4
Balance of Expenditure	13 4	52·1	37·5
Total Costs	25 7	100.0	71·9
Add Inventory Differences	10 0		28·1
Inclusive Costs	35 7	....	100·0

Statements "A" and "B" do no more than summarise from different angles data given in the immediately preceding Table. Attention can be drawn to the value of Labor (direct and indirect), namely, 6s. 5d. per Ewe, or one-quarter of Total Costs.

In Statement "C," on the other hand, Interest and Depreciation charges have been isolated from all other "Costs," and the value of mean Inventory Decreases has been added to Total Costs, with the result that what may be termed "Inclusive" Costs reach the high value of 35s. 7d. per Ewe. Percentages have been calculated in terms of both "Total" and "Inclusive" Costs. I propose discussing the significance of "Inventory Decreases" under a separate heading. In the meanwhile we shall note that over a period of 10 seasons combined Interest and Depreciation charges aggregated 12s. 3d. per Ewe per annum, or close on 48 per cent. of Total Costs. Depreciation charges on Improvements and Plant are normal and cannot be avoided. Interest charges, on the other hand, namely, 10s. 9d. per Ewe, must invariably weigh heavily upon farmers who, like Turretfield, are in debt to the extent of 100 per cent. of Capital Investment; and when droughts supervene, or prices fall to the extent that they have recently done, like Turretfield, such farmers must inevitably go under. To the farmer, however, whose farm is free from debt, interest charges on his personal Capital may continue to be registered, but they are no more than Book Entries, representing anticipated Earnings of his Capital. When, however, adverse conditions have temporarily to be faced, the farmer's Labor Income must take precedence of the earnings of his Capital, which for the time being he may have to forego. In such circumstances Total Costs per Ewe on a farm free of all debt may be said to be represented by 14s. 10d.

per Ewe rather than 25s. 7d., which includes interest on Personal Capital. In other words, a farmer who is able to free his farm of debt, when favorable seasons and prices obtain, is generally able to face with equanimity periods of depression and drought.

3. INVENTORY DIFFERENCES.

Inventory differences in this connection may be defined as the differences between the values of Opening and Closing Inventories, plus purchases and unsold natural increase. It follows that these differences account for deaths and losses, together with variations in the market value of the Flock; hence, roughly, they may be taken to be a measure of Flock Depreciation. The figure given in Statement "C," namely, 10s. per Ewe, may seem unusually high, but is accounted for in the main by the sudden drop in Sheep values in 1929. I have indicated below the mean inventory value of Sheep for the 10-year period ending in 1931-32:—

	Mean Inventory Value of all Sheep.				Mean Inventory Value of all Sheep.		
	£	*s.*	*d.*		£	*s.*	*d.*
1922-23	0	16	5	1927-28	1	12	7
1923-24	0	19	5	1928-29	1	9	11
1924-25	1	12	0	1929-30	1	8	4
1925-26	1	12	3	1930-31	1	0	3
1926-27	1	7	6	1931-32	0	17	11
				1922-32 Mean	£1	6	2

It will be observed that Inventory values per head reached a peak of £1 12s. 7d. in 1927-28; thereafter they declined slightly in 1928-29 and 1929-30, but fell abruptly—8s. 1d. per head—in 1930-31, and an additional 2s. 4d. in 1931-32. This decrease in value of the last two years leads to the relatively high mean inventory difference of 10s. per Ewe. In the closing year of the series, 1931-32, Inventory decreases were represented by 2s. 11d. per Ewe only.

4. HAND FEEDING.

There is no doubt that a Flock of Sheep thrives best on sweet, short, natural pasture, and, on the whole, it is probably both the best and cheapest way of providing for the feed requirements of Sheep. On the average farm, however, a greater portion of which is usually arable, this type of pasture is present to a limited extent only; it is usually represented by land temporarily out of cultivation which, according to seasons or circumstances, may or may not be covered by an adequate sward of feed (usually weed growth), and a farmer who has a flock adequate to the size of his holding, cannot afford to rely entirely upon the chance seedings of Nature. Hence, he is compelled to fall back upon the second best, which is a sown grazing crop. In this connection he has to take into consideration not only the suitability of the crop in question for grazing purposes, but also its "cost." Such a crop would from the outset be debited with the rental value of the land from its preparation for seeding to completion of grazing operations, together with pro rata rates and taxes chargeable over the same period. It follows that crops involving costly preparation of the land, or costly seed, must necessarily be avoided. Hence, for districts such as Turretfield nothing better can be recommended as a grazing crop for Sheep than Oats, sown sufficiently early in the season, on lightly and cheaply broken Wheat stubbles. Generally speaking, if the farm be adequately stocked, and the flock adequately handled, natural pasture and grazing crops should carry the Sheep until the stubbles of the new crops become available, that is to say, until January; these stubbles will support the flock during January and February; but from March onwards there is frequently a shortage of feed at the critical time that precedes Lambing. Those who are fortunate enough to have standing crops of Lucerne can take full advantage of them; but on the majority of farms, and in the majority of seasons, 4 to 8 weeks of hand-feeding is unavoidable.

We are frequently asked whether hand-feeding pays; it would certainly not pay anybody to hand-feed Sheep throughout the year, but no farmer can expect to handle a flock to any advantage who lets his flock fall away in condition immediately prior to and shortly after Lambing. The costs are never very considerable, and need not involve the use of anything not grown on the farm; a mixture of Oats or Barley with Wheaten Hay Chaff is perfectly satisfactory. Mean Costs incurred at Turretfield for hand-feeding in the 1922-32 decade are shown in Table XXXIII. to have been as follows:—

	Mean Costs of Hand Feeding per Annum, 1922-32.	
	Costs for 620 Ewes.	Costs per Ewe.
	£ s. d.	s. d.
Labor	7 3 11	0 2·78
Horses	2 0 2	0 0·78
Implements	5 16 7	0 2·26
Foodstuffs	80 2 3	2 7·01
Total Costs	95 2 11	3 0·83

During these 10 years—1922-32—Costs of Hand-feeding a Flock of 620 Ewes have been at the mean rate of £95 2s. 11d., or about 3s. 1d. per Ewe; this is by no means a large figure, and it is certain that failure to hand-feed would have involved far greater losses. Of course, hand-feeding costs will tend to vary within wide limits from season to season, and in order to make clear these limits I have indicated in Table XXXV. actual costs for each season in the 1922-32 decade:—

TABLE XXXV.

Summarising Hand-feeding Costs between 1922 *and* 1932.

	Total Costs.	Number of Ewes.	Costs per Ewe.
	£ s. d.	Nos.	s. d.
1922-23	9 7 3	429	0 5¼
1923-24	15 7 11	458	0 8
1924-25	1 16 2	530	0 0¾
1925-26	143 3 3	637	4 6
1926-27	40 1 6	683	1 2
1927-28	123 19 5	774	3 2½
1928-29	54 8 11	724	1 6
1929-30	275 7 1	678	8 1½
1930-31	272 2 4	666	8 2
1931-32	15 15 7	625	0 6

Heaviest Costs were incurred in the droughty seasons of 1929-30 and 1930-31, namely, 8s. 1½d. and 8s. 2d. per Ewe respectively; and Lowest Costs in 1924-25, 1922-23, and 1931-32, namely, ¾d., 5¼d., and 6d. respectively per Ewe.

5. MEAN FLOCK REVENUES.

Figures relating to Mean Flock Revenues have been summarised in Table XXXVI.

TABLE XXXVI.

Summarising Mean Flock Revenues for 1922-32—10-*year Period.*

	1922-32.
Mean Number of Ewes put to Rams	620

	Mean Flock Revenues, 1922-32.		
	Total.	Per Ewe.	% Percentages.
	£ s. d.	s. d.	
Lambs sold	501 5 5	16 2	47·10
Ewes sold	123 6 11	3 11	11·59
Rams sold	13 1 0	0 5	1·23
Killed for rations	25 8 11	0 10	2·39
Wool sold	379 19 6	12 3	35·70
Sheepskins sold	19 14 4	0 8	1·85
Show prizes	1 10 2	0 1	0·14
	1,064 6 3	34 4	100·00
Less Inventory differences	310 7 4	10 0	
Net Flock Revenue	753 18 11	24 4	
Less Expenditure	793 18 3	25 7	
Net Loss	−39 19 4	−1 3	

It will be seen from the above that on a basis of "Inclusive" Expenditure of 35s. 7d. per Ewe, the mean Net Loss on the Fat Lamb Flock was at the rafe of 1s. 3d. per Ewe put to the Rams. I shall recall that this expenditure includes 10s. 9d. for Interest Charges and 10s. for Inventory differences. If the farm were out of debt, Interest Charges could be temporarily overlooked, and this would make available 9s. 6d. per Ewe towards the farmer's Mean Labor Income.

During the 10-year period—1922-32—the Fat Lamb Flock Account closed on credit or debit balances on five occasions respectively. Details of these balances, together with mean prices realised for Fat Lambs and Wool in each season, are shown below in Table XXXVII.:—

TABLE XXXVII.

Showing Seasonal Profit and Loss Balances of the Fat Lamb Flock, together with Mean Prices Realised for Fat Lambs and Wool.

	Balances.		Mean Prices Realised.	
	Profits.	Losses.	Fat Lambs.	Wool.
	£ s. d.	£ s. d.	s. d.	s. d.
1922-23	124 17 0	—	24 4	0 7·5
1923-24	758 5 1	—	26 3	1 7·5
1924-25	398 18 0	—	30 4	1 3·6
1925-26	—	228 7 2	22 2	1 0·4
1926-27	76 6 5	—	18 10	1 1·3
1927-28	—	76 11 4	22 10	1 5·1
1928-29	116 1 10	—	25 1	1 0·7
1929-30	—	793 1 8	21 11	0 6·3
1930-31	—	617 1 5	15 1	0 4·8
1931-32	—	159 0 2	13 6	0 7·6
1922-32	—	39 19 4	21 5·8	0 11·96

It will be seen, therefore, that during the 1922-32 decade, in the course of which the Fat Lamb Flock Account closed at a mean loss of 1s. 3d. per Ewe, Lambs were sold at the mean rate of 21s. 6d. and Wool at 1s. per pound. The Mean Prices of Lambs varied from 13s. 6d. in 1931-32 to 30s. 4d. in 1924-25; and the Mean Price of Wool from 7½d. in 1922-23 to 1s. 7½d. in 1923-24.

6. Mean Per Unit Costs of Production of Wool and Fat Lambs at Turretfield.

When a single line of rural activity, such as the management of a Flock of Sheep, is responsible for two major lines of Revenue, namely, in this instance, natural increase on the one hand and Wool on the other, it is difficult, if not impossible, to apportion Inclusive Flock Expenditure adequately between one and the other, that is to say, Natural Increase and Wool respectively. Hence, in earlier reports no attempts were made to determine the Mean Costs of Fat Lambs on the one hand and those of Wool on the other. Quite recently, however, a Federal Committee appointed to inquire into the position of Wool Growers has not hesitated to make the attempt in the matter of Wool, but leaving the question of Natural Increase in somewhat nebulous condition; costs of production arrived at have been so unexpectedly high that it seems advisable to ascertain what corresponding Costs have been at Turretfield.

Towards this end we can make use of data given in Table XXXVI. This Table shows that apart from Wool and Fat Lambs, a secondary source of revenue is the sale of culled Ewes, or their use as rations, aggregating for the 10-year period ending in 1931-32, an average of £181 11s. 2d. per annum, or 5s. 10d. per Ewe put to the Rams. Strictly speaking, these sales are not so much "revenue" as realisation of Capital, and can therefore be overlooked and deducted from Inventory differences, which they naturally affect. Hence, data in Table XXXVI. can be modified as follows:—

Table XXXVIII.

Modified Summary of Flock Revenues—1922-32.

	Total.			Per Ewe.		% Percentages.
	£	*s.*	*d.*	*s.*	*d.*	
Lambs sold	501	5	5	16	2	56·79
Wool sold	379	19	6	12	3	43·04
Show prizes	1	10	2	0	1	0·17
Gross Flock Revenue	882	15	1	28	6	100·00
Less Inventory Differences	128	16	2	4	2	
Net Flock Revenue	753	18	11	24	4	
Less Expenditure	793	18	3	25	7	
Net Loss	−39	19	4	−1	3	

I am satisfied that it is quite impossible to itemise expenditure for Wool and Fat Lambs respectively; in practically every item of costs each are more or less concerned. I am of the opinion, therefore, that an approximation only is possible, and that the most rational approximation would be distribution of expenditure, plus inventory decreases on the basis of respective Revenue Percentages.

Overlooking the accidental small item of Show Prizes, this would mean that 56.88 per cent. of the Expenditure, plus Inventory Differences, would be attributable to Fat Lambs, namely, £524 17s. 3d. for an average of 466.66 Lambs, or £1 2s. 6d. per head; and 43.12 per cent. to Wool, namely, £397 17s. 2d. for a mean Clip of 7,466.8lbs., or 12¾d. per pound of Wool.

The above figures are the means of a decade—1922-32—during the course of which both costs and prices were considerably above average. The data upon which the figures of the Commonwealth Inquiry have been based are said to be those of 1931-32, during which season appreciable reduction in general costs had already taken place. Hence, for purposes of comparison, I submit below in Table XXXIX. corresponding Turretfield figures for Season 1931-32:—

TABLE XXXIX.

Modified Summary of 1931-32 *Flock Revenues.*

	Total.			Per Ewe.		Percentages.
	£	*s.*	*d.*	*s.*	*d.*	
Lambs sold	332	0	1	10	7½	61·11
Wool sold	211	6	6	6	9¼	38·89
Gross Flock Revenue	543	6	7	17	4¾	100·00
Less Inventory Differences	53	6	5	1	8½	
Net Flock Revenue	490	0	2	15	8¼	
Less Expenditure	649	0	4	20	9¼	
Net Loss	−159	0	2	−5	1	

Number of Ewes put to the Rams	Nos.	625
Number of Lambs sold	Nos.	493
Weight of Clip	Lbs.	6,473

Cost of Lambs in 1931-32 ...... £702 6s. 9d. × 0·6111 ÷ 493 = 17s. 5d. per head

Cost of Wool in 1931-32 .... £702 6s. 9d. × 0·3889 ÷ 6,473 = 10d. per lb.

……

Table XXXIX. shows that relatively to the 1922-32 decade very appreciable reductions in costs were realised in 1931-32, namely, Lambs cost 17s. 5d. per head instead of 22s. 6d., and Wool 10d. per pound instead of 12¾d.

Before contrasting Turretfield Costs of growing Wool in 1931-32 with corresponding figures suggested by the Commonwealth Wool Inquiry Committee as typical of Australian conditions generally, I think it necessary to stress the following points:—

1. Turretfield Costs are in every instance related to expenditure incurred on a Government Farm that has been run upon its own revenues for a period of 10 successive seasons.

2. Apart from depreciation, and limited interest on accumulated profits, all charges correspond to actual Cash payments.

3. The farm has paid full interest charges into the Treasury on all Capital Investments, including Land, at the rate of 5 per cent. per annum, and on Overdraft at the rate of 6 per cent.

4. There have been no interest reductions during these 10 years and consequently none in 1931-32.

5. The Mean Value of Land and Improvements was represented by £9 5s. 9d. per acre, representing an annual charge of 9s. 3d. per acre.

6. Total interest charges aggregated 10s. 9d. per Ewe, or 42.02 per cent. of Total Expenditure.

7. The mean carrying capacity of areas grazed by Sheep, inclusive of specially sown grazing crops, has been at the rate of a little over one Sheep to the acre.

8. Wages include a wholly Salaried Staff and a Manager.

9. The number of Ewes put to the Rams in 1931-32 was 625.

From the above it would seem natural to assume that the Cost of growing Wool on a small Farm of the Turretfield type, with its high overhead charges and small number of Sheep, would of necessity be considerably heavier per pound than on large station properties, on which Sheep are numbered in tens of thousands. And there are many who would add that Government management would be an additional reason for high costs of production at Turretfield. And yet, according to the Commonwealth's Committee, this does not appear to have been the case.

The Committee has prepared a table of Costs based upon 1931 data and collected from 44 New South Wales pastoral properties, which the Committee considers to be typical of Australian pastoral conditions generally. The method adopted by the Committee for determining these Costs is not very clearly indicated in the Report; nor are the data given sufficient for critical examination. The Committee appears to have aggregated certain items of expenditure and attributed them wholly to Wool, and other items presumably to other sources of income, including Natural increase. Overhead charges have been apportioned at the rate of 75 per cent. to Wool and 25 per cent. to other sources of income. This apportionment may be quite correct, but data given are insufficient to check it. It is stated that the value of revenue other than Wool has been deducted from Total Expenditure, apart from interest; this seems a rather gratuitous assumption that other sources of income are capable of doing no more than balance out-of-pocket working expenses. Apart from sales, no value seems to have been attributed to Natural Increase.

The final decision of the Committee is to the effect that on the basis of 1931 figures the mean cost of Wool production in Australia is represented by 14d. per pound at the point of sale, apart altogether from the costs of Management; if we add one penny for Management, which would represent a salary (including allowances) of £700 for a flock of 17,000 Sheep, this would raise the price to 15d., that is to say, 50 per cent. higher than Turretfield costs of 10d.

This figure seems to me so unbelievably high that I can only conclude that the 44 properties selected by the Committee were not representative of Australian pastoral conditions generally. I find it hard to believe that the costs of an industry upon which the prosperity of the Commonwealth and many private fortunes have been built up in the past are to-day not only 50 per cent. higher than recent costs on a small Government farm, but in addition more than 50 per cent. higher than prices offering for Wool in pre-War times. Hence, I prefer to believe that in so far as Australia as a whole is concerned, costs of production of Wool have been over-stated.

7. COSTS OF UPKEEP OF WORKING HORSES.

Apart from an occasional foal, Working Horses do not contribute anything directly to Farm Revenues, unless indeed circumstances compel the owner to take up contract work. Indirectly, however, through the power they supply, they must be looked upon as the mainspring behind farm production. Hence, an accurate determination of the cost of this power is of paramount importance to all Farm Accounts; this determination, moreover, has acquired added interest in Farm Economics since the introduction of Farm Tractors in our midst. In Table XL. I have summarised Mean Costs of Upkeep of Working Horses at Turretfield in the 1922-32 decade.

TABLE XL.

Summarising Mean Costs per Annum of Upkeep of Working Horses—1922-32.

	£ *s.* *d.*	£ *s.* *d.*
1. Opening Valuation (1922)	—	421 8 3
2. Mean Purchase of Horses	—	36 7 4
3. Mean Gross Cost of Upkeep—		
(*a*) Foodstuffs supplied	393 12 11	
(*b*) Pasture grazing (agistment)	47 16 11	
(*c*) Cost of water used	5 18 4	
(*d*) Wages	71 18 8	
(*e*) Shoeing, &c.	9 2 11	
(*f*) Sundries	2 3 9	
(*g*) Depreciation and repairs	32 16 10	
		563 10 4
		1,021 5 11
Less Sale of Horses	13 4 5	
Closing Valuation (1932)	425 12 3	
		438 16 8
Net Cost of Upkeep of 31·61 Horses		582 9 3

Determination of Costs of Horse-hour.

Mean Number of Horses	31·61
Mean Number of Horse-hours worked	29,936·7
Mean Cost of Horse-hour	4·67d.
Mean Cost of Horse Eight-hour Day	3s. 1·36d.

The above data show that during 10 successive seasons (1922-32) the Mean Cost of the Horse-Hour has been at the rate of 4.67d., or 3s. 1½d. per Eight-hour Horse day.

In Table XLI. the data have been compressed and expressed in terms of one Horse. For purposes of comparison and in order to bring into relief reduction in costs of production of recent years, corresponding figures have been given for 1922-30 Means, and for 1930-31 and 1931-32 seasons respectively.

TABLE XLI.

Summarising Mean Cost of Upkeep of a Single Horse (1922-32) *in Contrast with Corresponding Costs in* 1929-30 *and* 1930-31 *and* 1931-32 *Seasons, respectively.*

	1922-32.		1922-30.	1930-31.	1931-32.
	Costs.	Per Cent.	Costs.	Costs.	Costs.
	£ *s.* *d.*	%	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*
Wages	2 5 6	12·4	2 3 2	2 17 11	2 14 10
Foodstuffs	12 9 1	67·6	13 9 7	11 0 2	4 8 11
Grazing	1 10 3	8·2	1 13 2	0 13 9	0 19 7
Various	1 0 9	5·6	1 0 11	1 17 6	1 7 5
Plus Inventory Decreases less sales	1 2 11	6·2	1 3 5	0 8 3	0 3 6
Net Cost of Upkeep	18 8 6	100·0	19 10 3	16 17 7	9 14 3
Mean Value of Horse-hour	4.67d.	—	5·01d.	3·93d.	2.37d.
Mean Value of Eight-hour Horse-day	3/1½	—	3/4	2/7½	1/7

It will be observed that of recent years mean cost of upkeep of Working Horses have been very considerably reduced, chiefly as a result of the fall in price of Chaff and other foodstuffs. For the eight seasons ending 1930 the Mean Upkeep per Horse was at the rate of £19 10s. 3d. per annum, and the mean cost of an

Eight-hour Horse-day at the rate of 3s. 4d.; corresponding figures for the 10 seasons ending in 1932 were £18 8s. 6d. and 3s. 1½d. respectively. The decline in Costs in 1931-32 is very striking, namely, £9 14s. 2d. for Upkeep per annum of a Horse, and 1s. 7d. only for the Eight-hour Horse-day. This reduction in costs of Upkeep of Horses is naturally reflected in reduced costs of production of Crops in which Horses have supplied the motive power.

The relationship of the Mean Total Upkeep of 31.61 Working Horses at Turretfield—£582 9s. 3d.—to the Mean Area under Crop, the mean area cultivated (Crops plus Bare Fallow) and the total arable or farmed area is shown below:—

	£	s.	d.
1. Mean Inclusive Cost of Upkeep of 31.61 Working Horses on 1,266 acres of arable land (40.05 acres per horse)	582	9	3
2. Mean Cost per acre in relation to mean area under crop (651 acres, or 20.59 acres per horse)	0	17	11
3. Mean Cost per acre in relation to mean area cultivated (1,089 acres, or 34.45 acres per horse)	0	10	8
4. Mean Cost per acre in relation to total arable area	0	9	2

And since 31.61 Horses have in the course of a mean year worked 29,937 hours, or 3,742¼ eight-hour days, it follows that the mean effective work per horse has been at the rate of 118 days per annum.

I have summarised in Table XLII. mean quantities of Foodstuffs supplied and mean grazing areas made available per annum to Working Horses in the 1922-32 period:—

TABLE XLII.

Summarising Mean Foodstuffs Supplied and Mean Grazing Areas Made Available Per Horse—1922-32.

	Per Annum. Units.	Per Horse.
Cereal Hay Chaff................	Tons	3·45
Long Cereal Hay	Tons	0·30
Oats..........................	Bushels	4·14
Barley	Bushels	1·87
Grazing	Days	137

Mean Foodstuffs Per Horse Per Day when Not Grazing.

Cereal Hay Chaff................	Lbs.	33·89
Long Cereal Hay	Lbs.	2·51
Oats..........................	Lbs.	0·73
Barley	Lbs.	0·41
Non-grazing days	Nos.	228

8. THE COST OF PREPARATION OF BARE FALLOW.

As is generally the case in the settled areas of the State, Wheat crops in the Turretfield district, whether intended for grain or for hay, are usually preceded by nine months or thereabouts of well worked Bare Fallow. The preliminary work of breaking up the ground usually starts shortly after seeding, generally in July, and is usually completed by the end of August; the lighter subsidiary workings continue, according to circumstances, right up to seeding time. Costs involved vary considerably with the character of the soil, the depth of original ploughing, the number of tillage operations found necessary, and finally, seasonal vagaries. Turretfield land is stiff and heavy, and fallowing costs are proportionally greater than in light Mallee country. Costs incurred during 10 successive seasons have been summarised in Table XLIII.

TABLE XLIII.

Summarising Expenditure Incurred in Preparation of Bare Fallow.

	Total Costs.	Costs per Acre.	Percentage.
	£ s. d.	£ s. d.	%
Wages	91 2 2	0 4 1·9	15·9
Use of Horses	244 17 3	0 11 2·2	42·9
Use of Implements	48 6 0	0 2 2·5	8·5
Rent (9 months)	172 19 7	0 7 10·8	30·3
Rates and Taxes	13 15 8	0 0 7·6	2·4
Inclusive Costs	571 0 8	1 6 1	100·0
Mean Area Fallowed	437·9 acres		

In order to stress reduction in Costs of recent years I have summarised Costs per acre in 1930-31 and 1931-32 in contrast with Means of 8 and 10 years respectively:—

TABLE XLIV.

Summarising 1930-31 *and* 1931-32 *Costs Per Acre of Preparation of Bare Fallow in Contrast with Corresponding Means of* 8 *and* 10 *Years respectively.*

			Means.	
	1930-31.	1931-32.	1922-32.	1922-30.
	s. d.	s. d.	s. d.	s. d.
Wages	3 9·3	2 9·2	4 1·9	4 5·3
Use of Horses	8 11·9	5 0·4	11 2·2	12 5·7
Use of Implements	1 11·8	1 8·2	2 2·5	2 3·9
Rent (9 months)	7 10·2	7 10·0	7 10·8	7 11·0
Rates and Taxes	0 8·3	0 8·2	0 7·6	0 7·3
Total Costs	23 3·5	18 0	26 1·0	27 9·2

From the above it will be observed that in 1931-32 the inclusive costs of preparation of Bare Fallow were 18s. per acre, or 8s. 1d. less than the 1922-32 Means, and 9s. 9d. less than the 1922-30 Means.

9. MEAN COSTS OF VARIOUS FARM OPERATIONS.

General Farming is an avocation involving numerous individual field operations, all of which contribute in varying degree to the financial success or failure of the season's work, and although in every day practice actual costs of individual operations are rarely taken into consideration, it is not without interest to place on record these costs when accurate data are available for the purpose. The Turretfield Accounts have been kept in such a manner as to render possible the accurate determination of the cost of individual operations in any one season; and the means of these costs over a number of seasons may be taken to represent fairly accurately the position in Turretfield practice. I recognise that Turretfield recorded means may not always agree with estimates in current use—in some instances these differences may be due to variation in conditions; more frequently, however, they are attributable to human optimism, which usually bases the cost of farm operations upon ideal conditions of work, and rarely makes adequate allowance for break downs, broken time, depreciation, unfavorable weather conditions, &c. All these factors can be said to have been taken into consideration in the figures given in Table XLV., to the extent that they apply to a sufficiently large number of seasons, say, not less than three.

TABLE XLV.

Summarising Costs of some Individual Farm Operations at Turretfield.

	Number of Seasons.	Wages.	Horses.	Implements.	Sundries.	Totals.
	Nos.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
1. Costs per Acre—						
Fallow ploughing	8	1 10·8	5 4·2	0 11·2	—	8 2·2
Cultivating	8	0 9·7	2 2·9	0 6·3	—	3 6·9
Combine-cultivating	5	0 8·4	2 0·9	0 6·9	—	3 4·2
Harrowing	8	0 3·8	0 8·0	0 1·7	—	1 1·5
Cultivator-harrowing	1	0 7·3	1 8·0	0 1·0	—	2 4·3
Combine-drilling	8	0 10·1	2 2·2	0 7·8	—	3 8·1
Binding	8	1 10·2	1 4·4	4 10·6	2 10·2	10 11·4
Complete Harvester—						
1. Wheat	6	1 9·2	2 4·0	3 0·4	—	7 1·6
2. Barley	1	1 4·8	2 5·5	4 3·2	—	8 1·5
Reaper Thresher—						
1. Wheat	7	1 5·4	2 7·0	3 4·6	—	7 5·0
2. Barley	3	1 7·5	3 0·4	4 5·4	—	9 1·3
3. Pease	5	2 8·2	4 10·5	6 6·9	—	14 1·6
Stripper (Wheat)	1	3 2·4	2 8·4	3 2·7	—	9 1·5
Stooking	10	2 11·1	—	—	—	2 11·1
2. Costs per Bushel—						
Grading seed wheat	3	0 3·4	—	0 0·4	0 4·0	0 7·8
Wet-pickling wheat	3	0 1·6	—	—	0 0·5	0 2·1
Grading and dry-pickling	4	0 4·7	—	0 1·2	0 5·2	0 11·1
Complete Harvester—						
1. Wheat	6	0 1·2	0 1·5	0 2·0	—	0 4·7
2. Barley	1	0 1·0	0 1·7	0 2·9	—	0 5·6
Reaper Thresher—						
1. Wheat	7	0 0·8	0 1·3	0 1·8	—	0 3·9
2. Barley	3	0 0·7	0 1·4	0 2·1	—	0 4·2
3. Pease	5	0 2·4	0 4·3	0 5·8	—	1 0·5
Stripper (Wheat)	1	0 2·6	0 2·2	0 2·7	—	0 7·5
Winnowing wheat	2	0 2·6	—	0 0·2	—	0 2·8
Winnowing pease	4	0 2·7	—	0 0·3	0 0·1	0 3·1
Winnowing oats	1	0 2·2	—	0 0·4	—	0 2·6
Sewing bags	10	0 0·5	—	—	0 0·1	0 0·6
3. Costs per Ton—						
Stooking	10	1 8·8	—	—	—	1 8·8
Carting and stacking in field	10	5 8·5	2 10·0	0 3·4	0 0·2	8 10·1
Binding	8	1 2·1	0 10·4	3 1·3	1 9·7	6 11·5
Chaff cutting, including carting	10	6 0·9	1 8·4	4 6·9	1 0·0	13 4·2

PART III.

RECORD OF LIVESTOCK CARRIED ON TURRETFIELD AREAS AVAILABLE FOR GRAZING.

On any Farm upon which Livestock is kept, available grazing areas admit of classification under the following headings:—

1. Permanent Pasture usually non-arable.

2. Arable Land temporarily out of cultivation; this area may include both land left out of cultivation for the whole season and land which is being progressively fallowed from the close of Seeding Operations. For the latter it has been assumed in this Report that in any given year Land which is being fallowed would have been available for grazing for three months of the year.

3. Stubble grazing which usually becomes available immediately after the completion of Harvest Operations and continues in use until the end of March: thereafter, unless broken up for cropping, it has been classified in these Reports as land temporarily out of cultivation. Hence, it is assumed that the Stubbles of Winter sown crops are available for grazing for three months of the year.

4. Specially sown grazing crops: at Turretville, usually Oats.
5. Fallow grazing to maintain weed growth in check, a practice which—much to the detriment of perambulating Live Stock—is frequently abused.
6. Occasional feeding-off of over-rank Crops in danger of later lodging or blighting off.

Data concerning the extent to which these various types of grazing have been availed of at Turretfield have been carefully recorded since 1924, and the mean results have been summarised below in Table XLVI. For the most part, Sheep have been mainly grazed on these areas; to a limited extent, however, both Cattle and Horses have had access to them, and in order to bring down the figures to a common grazing unit, individual Horses have been assumed to be the grazing equivalent of nine Sheep, and Cattle of seven Sheep:—

TABLE XLVI.

Summarising Mean Sheep-carrying Capacity of Available Turretfield Grazing Areas (1924-32).

	Mean Grazing Areas Available Expressed as Acres per Annum.	Equivalent Number of Sheep Carried per Acre per Annum.
	Acres.	Sheep.
Natural Permanent Pasture	248·00	0·89
Arable Land Temporarily Out of Cultivation	274·49	1·02
Cereal Stubbles Pasture	131·01	0·28
Pea Stubbles Pasture	4·68	0·88
Grazing Crops (Oats)	115·82	1·33
Feeding-off Cereals	4·38	0·16
Totals	778·38	1·07

The foregoing statement shows that on a farm 1,533 acres in area, of which 1,266 acres are arable, an average of 1.07 Sheep per acre per annum has, during eight successive seasons, been successfully carried on the area available for grazing, namely, 778 acres, or an aggregate equivalent of 829 Sheep per annum. Over the same period, on the other hand, the mean area under harvested crops was 543 acres, and under Bare Fallow 434 acres.

In Table XXLVII., Mean Expenditure incurred on behalf of the several grazing areas, inclusive of the rental value of the land, has been summarised for the 1924-32 period:—

TABLE XLVII.

Summarising Mean Expenditure incurred on Grazing Areas, including Rental Value of Land—1924-32.

	Expenditure.		
	Total.	Per Acre.	Per Sheep.
	£ s. d.	s. d.	s. d.
Natural Permanent Pasture	64 10 10	5 2·5	5 10·1
Arable Land Temporarily Out of Cultivation	150 7 3	10 11·5	10 8·5
Cereal Stubbles Pasture	68 7 2	2 7·3	2 3·9
Pea Stubbles Pasture	4 9 10	4 9·5	1 4·3
Grazing Crops (Oats)	147 5 5	21 5·2	16 11·0
Totals	435 0 6	11 2·1	10 5·9

Table XLVIII. shows that over a period of eight seasons the mean cost of grazing areas available has been at the rate of 11s. 2d. per acre, or 10s. 6d. per Sheep grazed. In an earlier portion of this Report I have already stressed the fact that in almost any season a certain amount of Hand-feeding is unavoidable; and in the circumstances the Mean Costs of Hand-feeding should be added to other Costs incurred on grazing areas.

Mean Hand-feeding Costs for the 1924-32 period were at the rate of £115 16s. 9d. per Flock, or 3s. 5.8d. per Sheep; it follows that for the same period Mean Grazing Costs, plus Hand-feeding Costs, were at the rate of 14s. per Sheep.

GENERAL SUMMARY.

The salient features of the Concluding Turretfield Report may be summarised as follows:—

Part I.—Financial Aspects.

1. The Turretfield Demonstration Farm was run upon purely business lines between July 1st, 1921, and March 31st, 1932, when it was closed.

2. Towards this end the Farm was worked from its own Revenues, but subject to overdraft rights not to exceed £2,200.

3. Interest was charged, and paid into the Treasury by the Farm, on the basis of 100 per cent. value of Land, Improvements, and Stock and Plant. Interest on Overdraft was also charged and paid for by the Farm.

4. During the first seven seasons the Farm Accounts closed regularly on Credit Balances, aggregating £2,748 18s. 3d., or a yearly mean of £407 4s. 11d.

5. During the last four seasons—1928/29 to 1931/32—the Farm Accounts closed on Debit Balances, aggregating £4,371 7s. 5d., or a yearly Mean of £1,092 16s. 10d.

6. These successive losses were in the main attributable to a succession of unfavorable seasons, coupled with unprecedented fall in the money value of rural produce.

7. Nevertheless, had we been in the normal position of Land owners, having borrowed 50 per cent. of the requisite Capital instead of 100 per cent., notwithstanding unfavorable seasons and prices, we should have been able to struggle along. As matters stood, however, Interest charges were crippling and I was compelled to suggest the closure of the Farm, to which the Honorable Minister agreed.

8. Aggregate Inclusive Farm Expenditure over the 11 seasons—1921-32—was £32,815 14s., and aggregate Farm Revenue £32,213 18s. 6d., representing an aggregate loss of £601 15s. 6d., or £1,622 9s. 2d., after addition of Inventory decreases; that is to say, a Mean Loss of £147 9s. 11d. per annum in 11 years.

9. In Inclusive Expenditure was included £9,426 0s. 5d. paid into the Treasury for Interest Charges, or 28.72 per cent. of Total Expenditure.

10. The Main Farm Crop has been Wheat, immediately preceded by nine months of cultivated Bare Fallow and succeeded over a limited area by Pease for grain and Oats for grazing purposes. Pea Stubbles were usually sown to Wheat in the succeeding season. Sheep have been the main type of revenue earning Livestock in use.

11. In the 11 seasons, Capital Assets were written down by £3,126 9s. 6d., or nearly 46 per cent. of Original Value.

12. The mean amount per annum disbursed for Wages (inclusive of Manager's Salary) has been at the rate of £1,127 6s. 8d.

Part II.—Detailed Analysis of Farming Costs.

1. The Mean (1921-32) Capital of the Farm was £18,286 3s. 7d., or £11 18s. 7d. per acre. Of this total, Land and Improvements accounted for £9 3s. 9d., or 77 per cent; Tools and Plant 15s. 2d., or 6.4 per cent.; Working Horses 5s. 6d., or 2.3 per cent.; Revenue Earning Livestock 14s. 7d., or 6.1 per cent.; and Sundries 19s. 7d., or 8.2 per cent.

2. Over 10 successive seasons inclusive expenditure has been at the mean rate of £4,040 7s. per annum, or £2 12s. 9d. per acre. Of this expenditure £3,070, or £2 0s. 1d. per acre has involved definite Cash payments, including £876 13s. 7d., or 21.7 per cent. for interest; whilst the balance, £970 1s., or 12s. 8d. per acre has been absorbed by transfers, depreciation and interest on accumulated profits, or Turretfield Personal Capital.

3. Inclusive value of Management and Labor in this Mean Expenditure has been £1,127 6s. 8d.; if from the latter we deduct the mean yearly Loss of £257 0s. 9d. we would get £870 5s. 11d., which can be taken to represent what would have been the Mean Management and Labor Income of a Farmer and Family, had the latter been mainly responsible for all manual operations.

4. Mean Farm Revenue over this period of 10 years has been at the rate of £3,783 6s. 3d., or 49s. 4d. per acre; this sum, which is £257 0s. 9d. below Mean Expenditure, would not have been crippling upon a farmer who owned 50 per cent. of the assets, and who worked the farm with assistance of family labor.

5. Hence, I conclude that in competent hands a personal Capital of £4,000 should suffice for the purchase, equipment, and adequate working of a 1,000-acre Farm of the Turretfield type.

6. Over a period of 10 years "General Expenses" that could not be debited against any particular Account have been at the mean rate of £666 7s. 3d. per annum, or 8s. 8d. per acre, or again, 16½ per cent. of Total Yearly Expenditure.

7. In the 10 years under consideration—1922-32—Wheat yields have varied from 9.93bush. to 23.91bush. per acre, with a general mean of 19½bush. Mean "Costs" have varied from £3 14s. 10d. to £5 8s. 5d. per acre and from 3s. 8d. to 8s. 9d. per bushel; Mean "Costs" of the eight-hour day from 7s. 4d. to 13s. 5d.; and Mean Value realised for Wheat from 1s. 8.5d. to 6s. 0.4d. per bushel.

8. Graphic illustration has been given of the influence of variations in the "Costs" of Labor on Mean Costs per acre of growing Wheat.

9. Over a period of 10 years—1922-32—Mean Costs per acre of a 19½bush. crop of Wheat have been shown to have been £4 10s. 8d. and Mean Costs per Bushel 4s. 8d.

10. In these costs Interest and Depreciation Charges are represented by £1 11s. 7d. per acre and 1s. 8d. per Bushel, that is to say, over one-third of Total Costs; and Labor by £1 2s. 3d. per acre and 1s. 2d. per Bushel, that is to say, approximately one-quarter of Total Costs.

11. It is shown that recent economic changes have led to appreciable reduction in costs of production of Wheat. In the seven years ending in 1929 a 19.64 Bushel crop of Wheat cost £4 16s. 7d. per acre and 4s. 11d. per Bushel to produce, whereas in the three years ending in 1932 a 19.20 Bushel Crop of Wheat cost £3 19s. 5d. per acre and 4s. 1d. per Bushel; that is to say, reduction in costs of 17 per cent. to 18 per cent. It is assumed that when costs of Labor and Interest are taken into consideration a 20bush. crop will cost from 3s. 8d. to 4s. to produce in our Central and Lower North districts.

12. It is calculated that under Turretfield conditions the Labor of one man should suffice for the growing of 170 acres of Wheat.

13. A 16bush. crop of Wheat sown on Pea Stubbles cost £3 7s. 7d. per acre and 4s. 3d. per Bushel, whereas a 19½bush. crop sown on Bare Fallow cost £4 10s. 8d. per acre and 4s. 8d. per Bushel.

14. The Labor requirements of Wheat following Pease were 136 days per 100 acres sown, against 181 days for 100 acres of Wheat sown on Bare Fallow.

15. The Mean "Costs" of growing and stacking a 1⅘ (one and four-fifth) ton Crop of Cereal Hay sown on Bare Fallow was £5 6s. 10d. per acre and £2 19s. 4d. per ton. In this Cost, Interest and Depreciation charges are represented by 18s. 6d. per ton and Labor by 19s. 8d.; the balance—21s. 2d.—covers all other Costs.

16. It takes 8s. 10d. per ton to cart and stack Hay in the field; hence the cost of Hay in the Stook may be taken to be £2 10s. 6d.

17. Hay-growing offers more employment for Home Labor than Wheat growing, namely, 288 days per 100 acres against 181 days for Wheat growing.

18. A 1.35 ton of Cereal Hay—usually Oats—sown on Wheat Stubbles cost £3 12s. 3d. per acre and £2 13s. 4d. per ton in the stack, that is to say, 6s. a ton less than a 1.80 ton Crop of Hay sown on Bare Fallow. The probable reason of this unexpected difference is that whilst the Stubble Hay crop is cut continuously from a single field, the Bare Fallow Hay is usually cut from the headlands and harvest roadways of a Wheat crop.

19. A 21.22bush. Crop of Oats sown on Cereal Stubbles cost £2 15s. 4d. per acre and 2s. 7d. per Bushel. Labor requirements were represented by 119 days per 100 acres.

20. A 17.26bush. crop of Barley sown on Cereal Stubbles cost £2 12s. 1d. per acre and 3s. per Bushel. Labor requirements were 116 days per 100 acres sown.

21. A 13¼bush. Crop of Field Pease sown on Cereal Stubbles cost £4 per acre and 6s. 1d. per Bushel. In this Expenditure 22s. 10d. per acre represented Interest and Depreciation charges and 13s. 8d. cost of seed. This low crop yield does not justify the growing of Pease in this locality.

22. Mean Cost of Upkeep of a Fat Lamb Flock averaging 620 Ewes was, over a period of 10 years, at the rate of 25s. 7d. per Ewe, apart from Flock depreciation; in this expenditure 12s. 3d., or 48 per cent. represented Interest and Depreciation charges, and 6s. 5d., or 25 per cent. Labor.

23. To the above figure would have to be added 10s., which represents Inventory decreases, and includes Flock Depreciation from deaths and reductions in price values. Hence, Inclusive Costs per Ewe would be 35s. 7d.

24. During the 10 years mean losses from accident or disease were at the rate of 57 head per annum, or 5 per cent.

25. During the 10 years the Mean Costs of Hand-feeding have been at the rate of 3s. 1d. per Ewe; yearly costs have varied with seasonal conditions from ¾d. per Ewe to 8s. 2d.

26. During these 10 years Mean Flock Revenues have been at the rate of 34s. 4d. per Ewe, that is to say, 1s. 3d. below Inclusive Costs.

27. It is estimated that during the 1922-32 decade to the extent that it is feasible to apportion Expenditure, the cost of production of Fat Lambs has been at the rate of 22s. 6d. per head and the cost of production of Wool at the rate of 12¾d. per pound. During this period the average price realised for Lambs and Wool respectively was 21s. 6d. and 12d.

28. In 1931-32 costs of production were appreciably lower, namely, 17s. 5d. for Lambs and 10d. for Wool. The latter figure compares favorably with corresponding figure based upon 1931 data recently given by the Commonwealth Committee of Inquiry into Wool, as typical of Costs on Australian pastoral properties, namely, 14d. per pound, exclusive of costs of Management

29. During the 1922-32 decade the cost of Upkeep of Working Horses was at the rate of £18 8s. 6d. per annum per Horse; for the same period the value of the Horse-hour was 4.67d., and that of the eight-hour day 3s. 1½d.

30. Within recent years Costs have been very much lower; in 1931-32 Cost of Upkeep per Annum fell to £9 14s. 2d., and the values of the Horse-hour and the Horse eight-hour day to 2.37d. and 1s. 7d. respectively.

31. According to our 10 years' data the effective number of Working Days per annum have been 118 days per horse only.

32. During the decade the Mean Cost of the preparation of Bare Fallow, apart from Interest and Taxes, was 17s. 7d.; and the Inclusive Cost 26s. 1d. per acre. In 1931-32 corresponding costs were 9s. 6d. and 18s. respectively.

33. A detailed statement has been given of the Mean Costs of individual Farm Operations.

PART III.—RECORD OF LIVESTOCK CARRIED ON AREAS AVAILABLE FOR GRAZING.

34. Over eight consecutive seasons the Mean Area available for grazing at Turretfifield was equivalent to 778 acres per annum, or the equivalent of about one-half of the total area of the Farm. Over this period this grazing area carried the equivalent of approximately one Sheep to the acre per annum.

35. Similarly, over the same period inclusive Expenditure incurred on behalf of this grazing area has been equivalent to 10s. 6d. per Sheep per annum.

36. If to this figure we add the mean value of Hand-feeding, namely, 3s. 6d. per Sheep, it follows that mean costs incurred on the grazing area were at the rate of 14s. per Sheep.

It remains for me to express appreciation of the efficient manner in which the Manager of Turretfield Demonstration Farm (Mr. F. E. Waddy) has carried out his important duties. In this connection his task has been not only to direct farm operations in such a manner as to realise the best possible financial results that seasonal and market conditions admitted, but in addition to keep a faithful detailed record of all such operations. My personal belief in the accuracy of the numerous economic data submitted in this Report is very largely based on my knowledge of the Manager's efficiency.

To the Accountant (Mr. J. W. McDonald) and his Staff I am equally indebted. Theirs has been the wearisome task of classifying and collating the farm records of 11 successive seasons; and had it not been for their unremitting care and patience, it would have been impossible for me to give what I consider to be an accurate picture of Farming Costs of the last decade in the Central and Lower North districts of the State.

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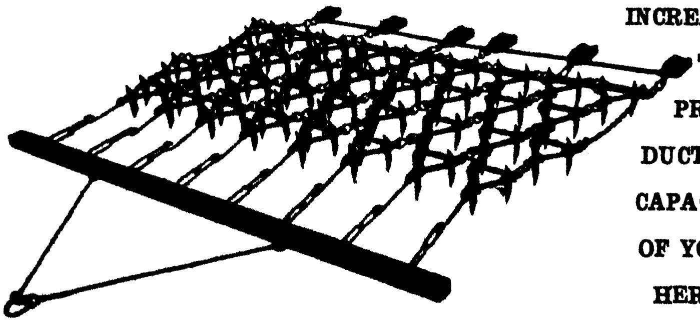

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THE CHAMPIONSHIP WHEAT CROP COMPETITION.

(Won by Mr. J. P. CARRIGG, Hamley Bridge.)

In his report on the Championship Wheat Crop Competition for the season 1932-33, Mr. W. J. Spafford (Deputy Director of Agriculture), who judged the entries, stated that for the past nine years Wheat Crop Competitions, supervised by the Department of Agriculture, have been conducted in South Australia. For the first six seasons the Government subsidised these competitions, but, unfortunately, found it necessary to discontinue the subsidy, with the inevitable result that the number of entries received show a decrease on those years when financial aid was given. The Department of Agriculture supplies the judges, who inspect the crops, make the awards, and prepare reports on all entries in the competitions.

Until well into the Spring the wheat crops of the State were exceptionally good, and it then appeared that the yield of wheat would create a record, many millions of bushels greater than were ever harvested before. Owing, however, to the peculiarities of the ripening season, diseases of the wheat crop were encouraged to such an extent in some districts that the hopes of the enormously heavy wheat yield were not attained, and in some cases things were so bad that Red Rust or the "Hay-die" form of "Take-all" led to almost total failures of some crops, and in many places pinched the grain. Diseased crops, a very low price for wheat, the general depression, and the lack of financial assistance for the competitions all tended to discourage farmers from exhibiting crops; nevertheless, 20 districts conducted competitions, and 385 crops were inspected. Only two of the 20 districts conducting competitions did not have crops sufficiently good for inclusion in the Championship Crop Competition.

Table Showing Progress of Wheat Crop Competitions.

Year.	Districts Conducting Competitions.	Number of Crops Exhibited.
1924	12	290
1925	13	248
1926	17	444
1927	19	525
1928	22	634
1929	21	520
1930	19	473
1931	16	352
1932	20	385

In 1927, the Royal Agricultural and Horticultural Society offered as a prize in connection with Wheat Crop Competitions, conducted under the auspices of the Department of Agriculture, a silver challenge shield of the value of 50 guineas, and annually a small replica of the shield valued at five guineas. The Royal Society had in view the offer of special assistance in the encouragement of Wheat Crop Competitions, and in accepting the generous offer, the Government agreed to conditions laid down by the society, which were as follows:—

1. The prizes go to the person exhibiting the best crop in the competitions supervised by the Department of Agriculture, the silver challenge shield for a period of 12 months immediately succeeding the award and the silver replica to become the absolute property of the winner.

2. The challenge shield, with the name of each year's winner engraved thereon, to be exhibited in the Town Hall or Institute nearest the farm on which the winning crop was grown.

3. The crop awarded first prize in each supervised district competition to be taken as an entry for the Championship Competition, except in any case in which it is thought by the judge of the district competition, that the winning crop is not of sufficient merit to warrant inspection for the championship trophy.

4. All entries for the championship to be inspected by one judge. Such inspection to be undertaken in each district soon after the district judge has made his awards, but not before the crop has ripened.

5. Each competitor for the championship to be required to stage one bag of grain and one sheaf (about 1ft. in diameter) of grain in the straw at the Royal Spring Show following the competition.

WINNERS OF THE CHAMPIONSHIP WHEAT CROP.

1927.	F. V. Trenorden, Bordertown. (Federation wheat).
1928.	F. Coleman, Saddleworth. (Leak's Rustproof and Fondling Wheats).
1929.	F. V. Trenorden, Bordertown. (Bena Wheat.)
1930.	H. C. M. Pilgrim, Wolseley. (Gallipoli Wheat.)
1931.	A. M. Dawkins, Gawler River. (Ford Wheat.)
1932.	J. P. Carrigg, Hamley Bridge. (Sword Wheat.)

THE ENTRIES.

All of the 18 crops in the Championship Crop Competition were well grown, and their inclusion in this important competition was thoroughly warranted, but some of the most promising of them had matured too rapidly under the peculiar ripening conditions that prevailed, with the result that the yields were reduced because of the shrivelling of the grain. A good deal of difficulty was experienced in placing the best of the crops in the correct order of merit, because of their general excellence as competition crops, and all of them reflect credit on the farmers who produced them.

THE AWARDS.

In reporting on the entries, it has been decided to follow the practice of other years of indicating the crops which would have been placed second and third to the winner of the championship trophy had this been an ordinary competition, but the other crops are not shown in order of merit, and where any remarks are made on their crops the exhibitors' names are placed in alphabetical order and not according to points awarded. The awards and a brief description of the crops submitted in the competition are set out below :—

THE CHAMPIONSHIP WHEAT CROP (SWORD WHEAT).

J. P. CARRIGG, HAMLEY BRIDGE.

The Central District Wheat Crop Competition was won by Mr. Carrigg's entry of Sword wheat, and it was adjudged to be the best competition crop in the Championship Wheat Crop Competition. Besides being one of the heaviest-yielding crops submitted, it was a good competition crop in all ways, except that it was not as true-to-type as is desirable. The crop of Sword was beautifully clean, only showing isolated plants of wild oats, mustard, and sheep weed. Of diseases, some plants showed a few spots of stem rust, but not sufficient to affect the yield or quality of the grain ; there were odd plants carrying flag smut, and a couple affected by bunt, but on the whole the crop was almost disease-free. Unfortunately, there were too many plants of varieties other than Sword mixed with the crop. Although the block of land carrying the crop consisted of two types of soil, it was a beautifully even and regular crop, and after having reached full maturity it still remained standing erect.

For some years now the field which carried the championship crop has been worked on the rotation of—(*a*) bare-fallow ; (*b*) wheat ; (*c*) pasture. The land was ploughed in July, harrowed in early September, and cultivated in late September, October, and April. In the second week in May, the seeding was carried out by putting 90lbs. seed and 100lbs. superphosphate (45 per cent.) per acre into the land with a combine.

The regularity of the crop and its freedom from weeds showed clearly that the cultivation of the soil was done properly and at the correct times, and great care was taken to see that nothing was missed at drilling time. As a matter of fact, everything about the crop, except perhaps the admixture of other varieties, drew attention to Mr. Carrigg's skill as a wheat-grower.

The Championship Trophy was won against very strong opposition, and nothing but an excellent crop could have secured it this year, and Mr. Carrigg warrants the heartiest of congratulations for producing a crop of such outstanding merit.

THE OTHER PLACED CROPS.

R. R. Wilson, Yeelanna (Ford and Quality).

With 35 acres of Ford wheat and 15 acres of Quality wheat, the first prize trophy in the Flinders District Wheat Crop Competition was won by Mr. Wilson, and both varieties made really good growth and yielded heavy crops of high quality grain. The crops were almost free from weeds, only showing odd plants of sheep weed, mustard, and burr clover. In the Ford there were isolated plants affected with flag smut, but this variety was almost disease-free, as was also the Quality, for there were to be found only a few spots of stem rust on the plants and certainly not sufficient to injuriously affect the quality of the grain. There was a light sprinkling of a brown-chaffed wheat in the Ford and a few bearded heads, still this variety was very fair as regards trueness to type, whereas the Quality showed a fairly high proportion of a wheat with very white chaff. Both crops were nice and even, the only noticeable variation occurring on the few strong outcrops where the crops became a little lighter.

In 1927, the field which carried this crop was in pasture, grew wheat in 1928, oats for hay in 1929, peas in part, and barley in 1930, and was left as pasture in 1931. In February, 1932, after a good fire, the land was ploughed with a mouldboard plough to a depth of 2½in., and culti-packed immediately. A cultivation was given in April, and a harrowing in early May. On May 25th, 70lbs. of graded and dry-pickled seed were sown to the acre with 1cwt. superphosphate, through a combine to which harrows were attached, and in nine days time a heavy harrowing was given to the crop.

At the time of judging, the crops had lodged very badly, but were giving high yields of good quality, and were very nice crops.

H. C. M. Pilgrim, Wolseley (Gallipoli).

The Tatiara District Crop Competition was again won by Mr. Pilgrim with a crop of Gallipoli wheat, but on this occasion it was not quite good enough to win the championship, as it did in 1930 for this gentleman. The crop was beautifully clean, only containing a few wild oat plants and an isolated thistle or two, but on the other hand it carried a fair amount of disease, showing a good lot of flag smut, some loose smut, a few very small patches of "Take-all", and most plants were spotted with stem rust, but the quality of the grain was not affected to any great extent. The crop was so true to type that it was extremely difficult to find any other variety as an admixture, and it is most unusual to see crops so free of other kinds. The bulk of this block of wheat was well grown, thick and even,. but some patches were drowned out, and in others the maturing was so delayed that on the whole the crop was rather uneven.

The land on which the crop was grown has been worked on the fallow-wheat rotation for some years, and for this crop was fallowed in April, cultivated in June, cultivated and harrowed in September, and after a rain in February, was again harrowed. About mid-May 60lbs. of graded and dry-pickled seed were drilled in to the acre with 70lbs. of superphosphate (48 per cent.).

The excessive amount of water in the hollows and low-lying land spoilt the chances of this crop of winning the Championship Trophy.

OTHER ENTRIES (IN ALPHABETICAL ORDER).

R. H. & W. O. Badman, Yacka (Sword).

This crop of Sword wheat, which came through the peculiar ripening period of the season extremely well, won the first prize in the mid-North District Crop Competition for the Badman Brothers. The cleanliness of the crop, which only showed odd plants of soapwort and mustard, a light sprinkling of wild oats, and some cape dandelion in the water-runs, was sure evidence of good fallow-working practices. There was so little flag smut, loose smut, and stem rust present that the crop was almost disease-free, but there was such an admixture of other kinds of wheat, that it was only fairly true to type. Except for a few water runs it was a beautifully even and regular crop.

The land which has grown wheat after fallow for some years was ploughed in August, harrowed in September, cultivated in October, March, and May, and was drilled on May 30th, with 75lbs. of graded and dry-pickled seed, and 80lbs. superphosphate (45 per cent.) to the acre.

S. C. Billinghurst, Minnipa (Felix).

The first prize in the Le Hunte District Crop Competiton was won by Mr. Billinghurst with this crop of Felix wheat, which although fairly clean, contained a fair amount of barley grass, odd plants of mustard, and a few small patches of poppy. There was just a little flag smut present, but stem rust was rather prevalent, still it appeared to have reduced the number of grains per head rather than having lowered the quality. The crop was fairly true to type, showing a sprinkling of bearded plants and a few with brown chaff. It was nice and even throughout the whole block.

The land carrying the crop was still under scrub in 1927, grew wheat in 1928, in pasture for the next year, then grew wheat in 1930, and was fallowed in 1931. A mouldboard plough was used to fallow the land in August, it was cultivated in August, October, and January, and weeds were kept down with sheep throughout the fallowing period. Between May 23rd and 28th the seeding was done by drilling in 60lbs. seed and 90lbs. superphosphate (45 per cent.) per acre.

H. Bird, Halidon (Nabawa).

This very clean crop of Nabawa wheat, which only contained odd plants of mustard and wild oats, won the Albert District Wheat Crop Competition for Mr. Bird. Although very little of any of the smuts was present, there was a lot of rust, which had a good deal to do with the pinched sample of grain harvested. There was such a lot of white-chaffed wheat, and some with brown chaff, that the crop was far from good as regards trueness to type. Most of the crop was very regular but leaning badly, and, if it had not been for the pinching of the grain, it would have proved a really good competition crop.

The land was in pasture in 1927, and then went through the course of fallow, wheat, oats, and was fallowed in 1931. The ploughing was done during the first week in July, and between that time, and seeding operations, the land was cultivated five times and harrowed four times. At seeding, 50lbs. seed and 93lbs. superphosphate were drilled in to the acre.

Mrs. W. G. Boundy, Minlaton (Ford and Ranee).

The Wheat Crop Competition conducted in Southern Yorke Peninsula District was won by Mrs. Boundy with 30 acres of Ford wheat and 20 acres of Ranee wheat. Although the crops were free from cultivation weeds, only showing a little mustard, poppy, wild oats, and soapwort, there were some barley plants in each variety. The Ford was almost disease-free, but the Ranee showed loose smut and stem rust, still the grain was not affected to any great extent. Neither crop was true to type, the Ford being particularly mixed. Both blocks of crop were even and regular. The Ford was a magnificent crop rather badly mixed.

The land has been worked on the rotation system of (*a*) fallow, (*b*) wheat, (*c*) barley, (*d*) pasture, and the fallow for this crop was ploughed in July and then harrowed, cultivated in August, harrowed in September, cultivated and harrowed in October, and cultivated in April. On June 6th the seeding was commenced, and 75lbs. seed and 90lbs. superphosphate were drilled in to the acre, and the block was then harrowed.

C. G. & G. W. CANT, KIMBA (Waratah).

The block of Waratah wheat which won the Buxton District Wheat Crop Competition for the Cant Brothers, was so beautifully clean that only a few isolated plants of mustard were to be found, and it contained such a little flag smut and only a few spots of stem rust that it was almost disease-free. There was a sprinkling of a white-chaffed wheat throughout the crop, but it was very fair as regards trueness-to-type, and it was a really even and regular crop. In every way it was a first class competition crop, but was not heavy enough to win the Championship trophy.

The three-course rotation of (*a*) fallow, (*b*) wheat, (*c*) oats, has been practised on the field which carried this crop, and the 1931 fallow was ploughed with a mouldboard plough during the first week in July, was harrowed in August, and cultivated in September, February, and April. At the end of May the seeding was carried out with a combine, when 45lbs. graded seed and 70lbs. superphosphate were put in to the acre.

H. H. CROSS, WOODCHESTER (Nugget).

A very attractive crop of Nugget won the Southern District Crop Competition for Mr. Cross. There were so few plants of sheepweed, poppy, oats, and Cape dandelion that the crop was really clean, but any chance it might have had of securing a place in the Championship was reduced by the presence of a lot of bunt, some loose smut, a little flag smut, a few small patches of hay-die, and a fair amount of stem rust. The crop was so beautifully true-to-type that great difficulty was experienced in discovering even a few strangers, and although there were variations in the thickness of patches, on the whole it was really even and was standing up well.

The land carrying the crop was fallowed in 1931 after having been left as pasture for the previous three years. The ploughing was done in July with a mouldboard plough and the land was immediately harrowed. During September two cultivations were undertaken, followed by a harrowing in early October, and a cultivation was given before the end of the month, and again in both April and May. Commencing on the 1st of May seeding was carried out by drilling, with a disc-drill, 70lbs. of seed pickled with bluestone and 100lbs. superphosphate (45 per cent.) per acre, and the whole block was then harrowed.

E. M. EDWARDS, PARUNA (Ranee).

Alfred District Crop Competition was won by Mr. Edwards with this crop of Ranee wheat which was almost weed-free, showing only odd plants of mustard. There was a fair amount of loose smut in evidence, but only a little flag smut, and a few spots of stem rust on the nodes of the stalks. There was just a light sprinkling of a white-chaffed wheat, but the crop was nice and true-to-type. Other than a few small patches of rank growth where the crop was leaning a bit and had blighted slightly it was a really even crop. A good competition crop in all ways, but rather too light for the Championship.

The land has been cropped a good deal in recent years with wheat and oats, but was fallowed in 1931 by being ploughed with a mouldboard plough in July, immediately harrowed, cultivated in September, twice harrowed in February after rains, and cultivated later. In the last week in April, a combine was used to put in 45lbs. seed and 80lbs. superphosphate (45 per cent)., per acre, and the block was then harrowed.

J. J. GALE & SONS, Gladstone (Sword).

The crop of Sword wheat with which Messrs. Gale & Sons won the Northern District Crop Competition was nice and clean, only containing a few wild turnips, a little wild oats, and odd plants of poppy and soapwort. There were a few isolated plants affected with flag smut or loose smut, and a few spots of stem rust, still the crop was very free from disease. Unfortunately, the crop was not true-to-type, there being a lot of a purple-strawed wheat and a light sprinkling of one with brown chaff. It was a very even crop and a good competition crop except for the admixture of other varieties.

The block of land has been cropped on the fallow-cereal-fallow-cereal system for some years now, and the 1931 fallow was ploughed in mid-August, harrowed on September 10th, and cultivated twice in October. Between May 23rd and 27th, 68lbs. of graded and dry-pickled seed were drilled in with 90lbs. superphosphate per acre.

H. O. LINKE, South Kilkerran (Ford).

This beautifully clean crop of Ford wheat, which only contained isolated plants of wild oats, mustard, sheepweed, catch-fly, and melilot, won the Mid-Yorke Peninsula District Crop Competition for Mr. Linke. Besides being clean it was almost disease-free, showing only four or five plants with bunt and a few spots of stem rust, and there were so few brown-chaffed wheat plants present that it was really good as regards trueness-to-type. The crop was leaning a little in places, and was a bit light on a few small patches of outcropping limestone, but was a very even crop, and in every way was a first class competition crop, but a bit too light to win the Championship Trophy this year.

The rotation of crops practised in this field has consisted of: (*a*) fallow, (*b*) wheat, (*c*) barley, for some time, and the fallow which carried the 1932 crop was ploughed in August, harrowed and cultivated in September, cultivated in March and April, and harrowed in May. Commencing on May 22nd, 80lbs. of seed and 120lbs. of superphosphate were drilled in to the acre.

T. F. ORROCK, Wepowie (Ranee).

The Far-Northern District Crop Competition was won by Mr. Orrock with this crop of Ranee wheat, which although it contained a few plants of wild oats, sheep weed, mustard, barley, stemless thistle, and barley grass was nice and clean, showing that the land had been worked intelligently. There was a rather heavy sprinkling of flag smut present; and sufficient stem rust to pinch the grain to a slight extent; and there was so much admixture in the crop that it was not at all true-to-type. A few strips were missed when drilling, but still the crop was fairly even.

Fallow-wheat-fallow-wheat is the system of cropping practised with this block of land, and the 1931 fallow was ploughed at the end of July with a mouldboard plough to a depth of 1½in. to 2in., harrowed in August, cultivated in September, and from then onwards kept clean with sheep until seeding time. Between 25th and 30th April, 55lbs. of seed and 62 lbs. superphosphate (45 per cent.) were sown to the acre with a combine.

P. McD. SMYTHE, Salter's Springs (Ford).

This strong, luxuriant crop of Ford wheat, grown by Mr. Smythe, won the Midlands District Crop Competition. It was beautifully clean, showing only isolated plants of mustard, wild oats, poppy and sheep weed, but unfortunately, besides odd plants affected with flag smut, there was so much stem rust present that the grain was pinched rather badly. The crop was only fairly true-to-type because of admixture of other kinds. Although a little lighter on the high land it was a very even crop. This was a wonderfully well-grown crop, but matured too quickly and so the grain was rather pinched.

The field growing this crop is cropped with wheat on fallow with an occasional spell as pasture, and in March, 1931, it was ploughed, then harrowed in July, cultivated in August and September, harrowed in October, harrowed and cultivated in April and cultivated in May. In the third week in May, 80lbs. of seed were drilled in to the acre with 120lbs. superphosphate (45 per cent.).

F. W. Sorrell, Barabba (Ford).

With this crop of Ford wheat, Mr. Sorrell secured first prize in the Balaklava District Crop Competition, and it was a really good crop, well-grown, and extremely clean, only showing isolated plants of mustard and poppy. It was almost disease-free, there being only a few plants affected with flag smut, and a few spots of stem rust on some plants. The crop was only fair as regards trueness-to-type, but other than about one-quarter of it being badly lodged through excessive growth, it was a heavy, even crop.

Since 1927, the land has been worked as fallow, wheat, barley, pasture, fallow, and this last fallow was ploughed at the end of June and beginning of July, harrowed in August, cultivated, harrowed and cultivated in September, cultivated in February, harrowed and cultivated in April, and harrowed on May 12th. Between May 19th and 21st, it was seeded with 70lbs. seed and 90lbs. superphosphate (45 per cent.).

Spratt Bros., Lameroo (Gallipoli).

The Chandos District Crop Competition was won by this crop of Gallipoli wheat grown by the Messrs. Spratt Bros., and it was a beautifully clean crop showing only isolated plants of wild oats, sheep weed, and melilot. The few spots of stem rust present did not appear to be doing much damage, but there was quite a lot of flag smut to be seen. The crop was so true-to-type that it was not easy to find even a few heads of other varieties in it. The growth of the crop varied a bit in different patches, but still was nice and even. This was an excellent competition crop.

In 1927, the land carried oats, in 1928, was left out as pasture, then fallowed and grew a crop of wheat in 1930, and the 1931 fallow was ploughed with a mouldboard plough in July, harrowed in August, cultivated in September, and cultivated and harrowed in March. In the last week in April, 60lbs. seed, and 93lbs. superphosphate (45 per cent.) were put in per acre with a combine, and then harrowed.

C. Yelland, Cunliffe (Waratah).

It was most difficult to find a weed, except a few isolated mustard plants, in this beautifully clean crop of Waratah wheat with which Mr. Yelland won the first prize trophy in the Northern Yorke Peninsula District Crop Competition. Besides some loose smut there was so much flag rust on the plants, together with some stem rust, that the grain was badly pinched. There were a few plants of two other varieties to be seen, but the crop was nice and true-to-type. Although leaning a bit this was an extremely even crop. As the crop approached maturity it must have been a beautiful competition crop, but it "finished" too quickly, and the grain was rather badly pinched.

In 1927, the field grew a crop of wheat, in 1928 it was fallowed, in 1929 it carried wheat followed by oats the next year, and in 1931, it was again fallowed by ploughing in June and then harrowing, by cultivating in September, and harrowing in April. On the 10th May seeding was commenced by putting 81 lbs. seed and 100lbs. superphosphate (45 per cent.) in to the acre with a combine.

F. N. Young, Warnertown (Ford).

The Western District Crop Competition was won by Mr. Young with this crop of Ford wheat, which was an attractive competition crop, except that it was far from true-to-type and was shedding a little. It was a beautifully clean crop having only a few small patches where wild oats were fairly thick, and odd plants of mustard and barley grass. There was very little disease present, and only one bunted plant and a few spots of stem rust were noticed. A brown-chaffed wheat was very prevalent, as well as a fair sprinkling of a very white-chaffed kind. The crop was nice and regular.

For some years now the land has been worked on the fallow-wheat-fallow-wheat system, and the last time it was fallowed—1931—it was cultivated in June and then harrowed, cultivated again in September and kept clean with sheep. In May, 70lbs. of graded and dry-pickled seed were put in with a combine.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR FEBRUARY.

[By Chas. H. Beaumont, District Horticultural Instructor.]

Most of the soft fruits will have been harvested, and drying operations will be in progress. A pamphlet is available on Fruit Drying and also on Dehydrators.

Plum growers will have noticed that some of the fruits, more particularly sweet varieties, have been attacked by the larvae of some moth, and may be of the opinion that it is the Codlin Moth trying a new "stunt". I strongly advise that every damaged fruit be collected and burned or boiled, instead of being left on the ground.

Keep soil about young trees and vines loose and free from weeds.

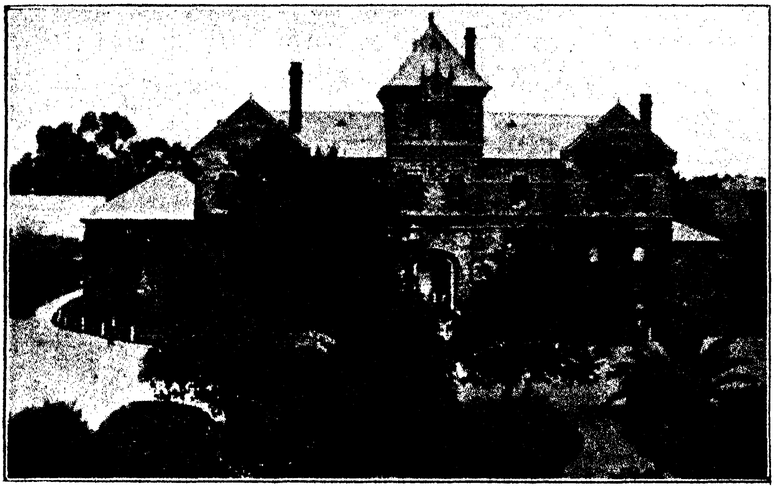
Watch vines for Oidium ; it is not too late for an attack.

Mark any specially good trees, if grafts or buds are likely to be wanted.

Scale insects on citrus trees need immediate attention. In using the White Oils only fresh water should be used for diluting, and the work should be done during cloudy weather, or early morning.

Apple packing will soon be on the way, and packers should make themsleves acquainted with the Regulations governing same, and so avoid liability of the confiscation of their fruit. Recently I was able (with many others) to inspect several boxes of apples which had been grown in British Columbia, Canada, and in Oregon, U.S.A., and exported from there to London. They were purchased from an ordinary consignment and sent to us for educational purposes. From the remarks passed one may be excused if we say that the education derived was but slight. Everyone seemed to be sure that the pack was no better than ours ; that the faults found in ours were also to be found in the imported lot. But I am of the opinion that by a more critical examination, we might have learned several points which will be to our advantage to emulate. Firstly, the box was undoubtedly a firmer one than those we use ; ends and sides, tops and bottoms, were all firmer, not much perhaps, but enough to ease the pressure of the overburden ; the boxes were of one piece, tops, bottoms, sides, and ends. Sizing was not quite perfect, neither was ours, or any other pack sized by a machine and packed by piecework, though the faults are remarkably few. However no size was marked on the box, the number of fruits being the guage of quantity. The weight of fruit in the box, in some instances, was less than we are supposed to get into our boxes, but again no weight was specified ; the whole procedure seems to be concentrated on packing to prevent damage, and the good appearance of the fruit was sufficient testimony that the method of packing gives good results. One point was missed, and that was the even quality and color. The red varieties were red, every one of them, and were good to eat, whereas oftimes our Jonathons and Romes are green apples with a few red streaks, and at times are woody, even though they comply with the Regulation for the Standard pack, The imported samples are packed on the co-operative or community system, and many thousands of boxes may be bought, year after year, alike in quality and color, whilst our comparatively small individual packs vary considerably in every way. We will not get the confidence of buyers while this continues.

Currant drying will be commencing soon, and the non-irrigated districts have the challenge before them, to put up a pack equal to that of the River Murray settlements. The soil moisture has been good throughout the summer, and the vines look splendid. It remains for growers to handle the grapes in such a manner that the dried product will be of the best.



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"TAKE-ALL."

INCIDENCE AND CONTROL ON THE LIGHTER SOILS OF THE MALLEE.

[By R. L. GRIFFITHS, Agricultural Instructor.]

The fungus disease "Take-all" caused widespread damage to wheat crops in the Mallee areas of South Australia during the 1932-33 season, more particularly on the newer settled land and on the lighter classes of soil. So serious was its effect that many farmers had their prospective wheat yields very considerably reduced, and almost all suffered from it to some extent.

The amount of "Take-all" present in wheat crops varies from year to year, but in every year there is some appearance of the disease, and some reduction of yields in consequence. The purpose of this article is to discuss the conditions which appear to favor "Take-all" and to define the means to control it.

DESCRIPTION OF THE DISEASE.

"Take-all" (*Ophiobolus graminis*) is a fungus disease which attacks the base of the stem, and also affects the root system of the growing wheat plant. Other species of fungus, such as the *Helminthosporium* spp., and *Wojnowicia graminis*, act in a very similar way, and for practical purposes all can be treated as the one disease. The effect of the fungus is that drawing its nourishment from the wheat plant the attacked plant becomes so weakened that it cannot live, especially when soil or climatic conditions are unfavorable.

The disease is recognised by the discoloration at the base of the stem. When plants are attacked and killed during the early stages of growth the base of the stem is usually covered with a brown or black powder. Those attacked at a later stage, after the appearance of the ear, often show only some staining at the same place. The disease can always be defined in this way, as distinct from plants or patches killed out by wind or frost damage.

The initial attack is mostly seen by plants dying in the early stages of growth. This usually appears in patches, spreading from a centre, although not necessarily so, as sometimes the early mortality is confined to isolated plants scattered throughout the crop. In all cases examined during the past season, where damage had been caused by "Take-all" infestation in the "Hay-die" stage, some plants which had been killed early in their growth could be found. This would appear to show that there is a development and spreading of ascospores during the growing period of the wheat plant, as recently suggested by Mr. Geoffrey Samuel, Plant Pathologist of the Waite Agricultural Research Institute.

Most of the damage is done at or after the flowering stage of the plant. This has been commonly called "Hay-die," and many farmers believe that it is a different trouble from "Take-all." There is no doubt, however, that it is a later infestation of the same disease, and whether the trouble spreads from affected centres, or is scattered indiscriminately throughout the field the effect is eventually the same. It can always be noted that the weaker plants die first, and at times the crop has a mottled appearance, due to the fact that the stronger plants, although evidence of the disease can be found on the stem, are still resisting it, and these often do not succumb until the grain is partly formed.

It appears certain that all of the infection is from spores in the ground, that the disease is very widespread throughout the wheat-growing areas, and that only by methods which leave as few living spores in the ground as possible when the crop is sown, and which at the same time encourage the development of strong wheat plants can it be kept in check.

CONDITIONS WHICH APPEAR TO ENCOURAGE THE DISEASE.

During the past year the chief factor which seemed to influence the incidence of the disease was the class of ground on which the crop was sown. On farms with a proportion of sandhill country and the balance of the area clay flats most of the damage was on the sandhills. In this particular season the result was aggravated by the fact that winter conditions did not suit the lighter soils, and the crops grown on them never looked vigorous. Every year, however, the chief damage is done on soils where the seedbed is not compact. This has been very completely demonstrated during the recent period of low rainfall years, when, with dry conditions and much wind, there has been considerable drifting of surface soils. It has been noticeable that the " Take-all " infestation has not been on hard places from which the surface soil has drifted, but on the parts where it has accumulated, which, although fertile, remain loose and open for a very long period. There is no doubt that the chief reason for " Take-all " is lack of compacted seedbeds.

This is also shown in another way. Rain is the soil compacting agent, and the heavier the individual fall the greater is the consolidating effect. During years in which all rains are light, even when they are frequent and the total normal or above normal average, " Take-all " infestation is severe.

The rainfall also seems to exercise some control in another way over the disease. It appears more frequently in areas with a good rainfall than in low rainfall parts. In the Murray Mallee district very little damage has been done by this disease in the localities with an average annual rainfall of 10in. to 12in., and, as the average increases, so is the disease more dangerous. There is no doubt that wet spring conditions encourage it, probably because moist warm weather assists in the development of spores for further infestation.

Other climatic conditions during the spring and early summer also have considerable effect. The wheat plant has some resistance to this disease, and if the weather during and after the flowering stage is favorable the plants often mature without damage, while excessive heat or stormy winds will encourage a rapid spread of " Take-all " in the " Hay-die " stage.

" Take-all " rarely appears on new land growing the first crop, and if isolated plants are affected inquiry has always shown that the new land is adjoining cleared areas, from which diseased particles of wheat straw, or grass could have been blown by the wind.

It frequently appears after the first crop, particularly when the foolish policy of growing several wheat crops in succession is adopted. There is no doubt that much of the present trouble has been caused by the general practice in the past of overcropping new mallee areas with wheat. From every point of view this is not advisable, as the country is cleared of shoots more rapidly, and cropping results are consistently better when a reasonable rotation is adopted from the start.

MEANS OF CONTROL.

Some farmers seem to think that their farms must go through a " Take-all " period when the disease can not be handled, and that time is the only controlling factor. This is definitely not so. The variation of damage on neighboring properties, cleared at the same time, with soil and climatic conditions exactly similar, shows that control is very largely in the hands of the individual farmer.

Control by Fire.

The spores of " Take-all " develop on the diseased portions of affected plants, and are eventually discharged and spread from these, therefore the initial control is to destroy such means of infection, and the most effective means of destruction is fire. Because the ploughing in of stubble and grass residues assists in the control of drift on sandy land, during recent years this policy has been adopted by many farmers, with beneficial effect. But it must not be considered when the crop or pasture has been affected by " Take-all ". On such farms the only safe stubble to plough in is oat stubble, and then only if it is handled in such a way that the straw will not damage the seedbed when the following crop is sown.

Special care must be taken after an infestation of " Take-all ", to get clean burns, as early in the year as possible. Arrangements should be made to carry the fire across the affected patches, on which there is little or no straw. Work with the fire-rake, which carries the heat continuously, is useful in this respect.

In heavy stubbles where the fire will run freely, straw should be carried by harrows, or other means, to the diseased places before the fire is started.

Wheat is not the only crop affected. Barley stubbles should also be burnt, as this crop carries the disease. Barley grass is very susceptible, and during 1932, Barley grass could be found continually which had been killed by " Take-all ". After any serious infestation it would be a very wise policy to burn Barley grass pastures in addition to stubbles, even if stock had to be hand fed for a time. In any case, the feeding value of dry Barley grass is very low.

It often happens that crops affected by " Take-all " are cut for hay. In such instances the straw should be cut high from the ground, leaving the diseased portions on the field, with sufficient residue to carry a fire.

Many examples are seen of the value of fire as a control, particularly noticeable when a paddock has been partly burnt, the area burnt almost invariably showing less disease than the remainder.

CONTROL BY CULTIVATION.

More effective control will be obtained by correct methods of cultivation than by any other means. So much is this the case that it is sometimes stated that if seedbed conditions are right, " Take-all " need not be feared. It is certain that the compactness of the seedbed is a very important factor in this respect. " Take-all " does practically all of its damage on loose seedbeds, probably not because these conditions particularly encourage the disease, but because they discourage the wheat plant, and so reduce its resistance.

It must be remembered that the chief compacting agent is rain, and that all the farmers' cultivation work should assist the rain in this respect. Unfortunately some of the work done is reducing rather than increasing this effect, particularly fallowing too deeply on light soils, as the subsequent rain is often not sufficient to consolidate disturbed underlayers, and therefore an initial ploughing of only 1½in. to 2in. in depth is advisable.

The time of fallowing is important; when examining crop competition results it is always seen that the majority of crops which show much " Take-all " are on the later fallows. Early fallow has the following advantages in checking this disease—

1. It gives a longer period during which the land carries no host plant, and so a greater proportion of " Take-all " spores in the soil germinate and die.
2. It prevents the growth of grass and self-sown crop during the winter months, on which the disease might develop and spread before fallowing.
3. It encourages seedbed compactness as most of the winter rain falls after the land has been fallowed.

Cultivating light soils when comparatively dry will tend to make them more open instead of more compact. So far as possible all work should be done on these soils when they are very wet. Striking beneficial results both in disease control, and in general strength and yield of crops have been obtained by farmers who go out during or immediately after rain to cultivate their sandy land, because at this time the land supports the implement better at an even depth, and also because sand will only press together successfully when very wet.

Implements should be used which most assist compaction, those which carry their weight over the greatest surface, on broad shares. Thus to improve seedbed conditions light implements, with narrow points, should be definitely avoided, especially if the tines are strained or irregular. There is nothing better than skim ploughs, scarifiers, and tine cultivators, all of which are heavy implements, and can be fitted with broad shares, so that the weight is pressing downward evenly, at a regular depth over the seedbed.

It is necessary to commence seedbed improvement right from fallowing time, and to make each cultivation effective in this respect, as mistakes made at any time with seedbed disturbance, are very difficult to correct at a later date. It is possible that rolling or cultipacking during the autumn may assist where seedbeds are not in good order, but the implement would need to be very heavy. There have been cases recently in the Murray Mallee District where such work has been done, and "Take-all" infestation subsequently has been very serious, showing little difference on the rolled or cultipacked area. An examination of the soil in these cases has shown that the effect of the packing has been all on the surface 2in. of soil, and that the seedbeds were still loose. It is difficult and expensive to get an implement of this sort sufficiently heavy to affect the underlayers to any appreciable extent.

CONTROL BY CROP ROTATION.

When a severe attack of "Take-all" occurs it is necessary in addition to other means of control, to starve it out by not growing susceptible plants for as long a period as possible, because otherwise the disease will tend to increase each year. Certain plants in addition to wheat are known to be susceptible, and they must be avoided when "Take-all" appears. Barley carries the disease, although usually Barley crops are not affected so badly as wheat crops. Certain grasses, among them those most common in the Mallee, are very susceptible. Barley grass (*Hordeum murinum*) becomes very badly affected, and undoubtedly is a prolific cause of the spread of "Take-all". A coarse spear like Brome grass (*Bromus sterilis*) which is becoming very common on some of the Mallee farms is also affected. Silver grass (*Festuca bromoides*) although not definitely proved so, is thought to be susceptible.

On the other hand oats are practically immune, and recent evidence tends to show that the most valuable pasture grass of the Mallee—Wimmera Rye grass—also acts as a control.

The control of "Take-all" by rotation is very plainly shown by the Chandos District Wheat Crop Competition for 1932, which had 50 entries. The general policy of these farmers has been to widen rotations, including many pasture years. This season the position, so far as the competition crops are concerned, naturally the crops showing the least disease on the farms, has been different. A quotation from the report, concerning rotations, is as follows:—

"In past years the chief feature of such analysis has been the comparatively wide general rotation with a high percentage of pasture years. This season it is quite different. The percentage of pastures in the whole of the rotations for the four years preceding the 1931 fallow is only 17 per cent., and in the crops from the leading half of the competition is lower still, only 13 per cent. If the first 10 crops be taken this is still more striking as there are only three pasture years showing out of the 40 rotation crops given. There can be only one reason for this. "Take-all" is quite a serious trouble this year, most of the natural pastures are Barley grass pastures, and it is evident that the crops following Barley grass pastures are showing more "Take-all" than those following other rotations."

Some farmers have adopted a vigorous policy of pasture improvement, using Wimmera Rye grass to replace the other pasture plants. This can be done quite cheaply by sowing small quantities of the seed, 1lb. to 2lbs. per acre, through the drill when seeding grain crops. The plant is strong, and, when encouraged, will eventually reduce or eliminate other pasture plants, particularly Barley grass. It will grow throughout the Mallee, and although difficult to eradicate on fallow is no worse in this respect than many other plants, and evidently does not carry "Take-all" through the pasture or fallow period. In all cases seen last year where Wimmera Rye grass was the main pasture plant the farm was practically free from "Take-all."

The rotation policy, where "Take-all" has appeared, should be to grow oats as much as possible. Where there has been serious infestation an oat crop on fallow land is advisable before another crop of wheat is sown. Farmers often state that the price for oat grain is so low that it is unprofitable, but even at a low price a good crop of oats must show better returns than wheat crops reduced by "Take-all" to a yield of a few bushels per acre.

Failure in "Take-all" control from oat crops can only be caused when susceptible plants grow with the oats. It often happens that lack of cultivation prior to seeding allows Barley grass and self-sown wheat to grow with the crop. For this reason a quick growing variety should be chosen, which may be sown late. Quite often, also, the seed oats has a mixture of Barley grain, and any of these plants may carry the disease through to the following season.

Where Barley grass is the main pasture plant and "Take-all" appears, the land should not be allowed to go to pasture for some time. Wimmera Rye grass should be sown. This will eventually increase stock-carrying capacity, and the keeping of a larger flock of sheep will assist soil compaction, and so also help in the control of "Take-all." In the meantime, to provide grazing, oat crops can be used.

OTHER FACTORS WHICH ASSIST CONTROL.

Any method which assists in growing a strong plant of wheat will help to reduce the amount of "Take-all" in the crop. Thus, such matters as using well-graded seed in such quantity per acre as has proved most successful for the district are important.

The time of seeding is of particular importance. On "Take-all" infested areas it is wise to sow as late as possible, as this gives a longer fallowing period and an additional opportunity, after opening autumn rains, for "Take-all" spores in the ground to germinate, and, in the absence of host plants, to die. There appears to be little difference in the resistance of wheat varieties to "Take-all," but the later seeding implies that early, vigorous, quick-growing wheats must be used.

The application of superphosphate undoubtedly exercises some control. There have been definite cases which prove that higher applications of this fertiliser definitely reduce the amount of disease. Certainly the effect of higher dressings is that the wheat plant is stimulated, and so develops more resistance. In addition to the direct effect on the plant the residual effect of high super dressings, by stimulating clover growth in the pastures at the expense of grasses which may carry the disease, is also of benefit.

During the development period of new wheat areas, particularly in the Mallee, there seems to be a time when the land is very susceptible to "Take-all." The reasons for this are probably lack of soil compaction, due to the presence of much coarse, undecayed vegetable matter, the irregular cultivation due to stumps, and sometimes stones also, and the general lack of efficient methods, due to the financial position of the farmer. If every effort be made to adopt the best possible methods the danger of serious attacks from the disease will be greatly reduced or even eliminated.

SEED WHEAT FROM COMPETITIONS.

In Wheat Crop Competitions conducted in the undermentioned districts, the following competitors exhibited crops which, in the opinion of the judges, will produce grain suitable for seed purposes:—

District. Competitor. Address. Variety.

Western—
F. N. Young, Warnertown—Ford and Greig's Selected.
L. C. Roberts, Port Pirie—Currawa.

Alfred—
O. E. Klau, New Residence—Ki (Selection Late Gluyas).
G. J. Zimmermann, Meribah—Ki (Selection Late Gluyas).
A. C. Webb, Paruna—Nabawa and Gallipoli.
E. M. Edwards, Paruna—Ranee.
W. Paull & Sons, Alawoona—Nabawa.
B. L. Finey, Alawoona—Nabawa.

Albert—
E. J. Marrett, Wanbi—Bald Early.
Rundle Bros., Caliph—Bald Early.

Russell and Buccleuch—
Sanders Bros., Karoonda—Nabawa and Sword.

Central—
J. Eden, Sheaoak Log—Waratah.
G. Hienjus & Son, Sheaoak Log—Daphne.
J. R. Smith, Smithfield—Federation.
W. A. Roediger, Gawler River—Ford and Sword.
A. M. Dawkins, Gawler River—Ford.
E. Day, Wasleys—Sword.
R. Perry, Wasleys—Sword.
B. Buckby, Wasleys—Sword.
Currie Bros., Wasleys—Sword.
M. H. Richter, Wasleys—Sword.
L. W. George, Wasleys—Sword.
J. P. Carrigg, Hamley Bridge—Sword.

Southern—
C. Brook, Woodchester—Nugget.
H. H. Cross, Woodchester—Nugget.
H. S. Stanton, Hartley—Nabawa.
E. T. & L. Jaensch, Hartley—Nabawa.
J. F. C. Paech, Hartley—Nabawa.
A. R. Strauss, Monarto South—Currawa.
Thomas Bros., Monarto South—Nabawa.
A. F. Braendler, Monarto South—Currawa.
C. F. Altmann, Monarto South—Sultan.

Frayville—
C. A. G. Faehrmann, Mannum—Nabawa.
J. O. Bottroff, Palmer—Nabawa.
I. H. Wachtel, Palmer—Nabawa.

Buxton—
C. G. & G. W. Cant, Kimba—Waratah.
R. B. Cant, Kimba—Waratah.
C. C. Sutton, Kimba—Early Gluyas.

Far Northern—
B. Koch, Morchard—Ranee.
H. G. Kupke, Morchard—Free Gallipoli.
A. J. Twigden, Morchard—Sultan.
E. H. Hampel, Wilmington—Onas.
J. Scriven, Orroroo—Waratah.
T. A. Brown, Eurelia—Queen Fan and Waratah.

SEED WHEAT COMPETITIONS—*continued.*

District. Competitor. Address. Variety.

NORTHERN YORKE'S PENINSULA—
G. E. and H. M. Meier, Paskeville—Sword.
S. G. Chynoweth, Boor's Plains—Waratah.
T. Stanway, Boor's Plains—Waratah.
N. Cross, Boor's Plains—Waratah.
C. and E. Yelland, Cunliffe—Waratah.
T. Rodda, Thrington—Waratah.
J. H. Bussenchutt, Paskeville—Waratah.
J. L. Bussenchutt, Paskeville—Waratah.
M. Yelland, Cunliffe—Dahpne.
C. Rodda, Thrington—Sword.
M. H. Lamming, Paskeville—Aussie.
D. G. Harris, Paskeville—D.G.H.

BALAKLAVA—
F. W. Sorrell, Barabba—Ford.
D. J. Wilson, Barabba—Ford.
O. L. Wilson, Barabba—Ford.
Harkness Bros., Owen—Ford, Waratah, and Sword.
L. C. Mills, Balaklava—Waratah.
O. L. Wilson, Barabba—Waratah.
R. H. Shepherd, Balaklava—Nabawa.
Bowyer Bros., Owen—Nabawa.
S. Hall, Owen—Nabawa.
J. H. Campbell, Barabba—Sword.

MID NORTH—
Catford Bros., Hoyleton—Sword.
A. Maitland, Rochester—Nabawa.
F. J. Pedler, Koolunga—Sword.
H. E. Weckert, Koolunga—Sword.
E. D. Whitehorn, Koolunga—Sword.
E. H. Bentley, Koolunga—Sword.
A. A. Bentley, Redhill—Sword, Waratah.
A. S. Kirk, Clement's Gap—Ford.
A. P. Kirchner, Redhill—Ford.
R. H. Badman, Yacka—Sword.
Higgins Bros., Georgetown—Nabawa.
Mrs. J. A. Lyons, Georgetown—Ford.
E. Smart, Gulnare—Nabawa.

MID YORKE PENINSULA—
J. C. Arnold, South Kilkerran—Nabawa.
S. W. Heinrich, South Kilkerran—Geeralying.
O. H. Heinrich, South Kilkerran—Geeralying.
R. E. Hasting, South Kilkerran—Dan.

LE HUNTE—
S. C. Billinghurst, Minnipa—Felix.
D. V. Kitto, Minnipa—Bena.
G. Williams, Minnipa—Late Gluyas.

CHANDOS—
H. E. Angel, Pinnaroo—Gallipoli.
J. H. and C. H. Spratt, Lameroo—Gallipoli, Felix, Waratah, and Sultan.
C. E. Koch, Lameroo—Sultan.
P. Ross, Parrakie—Gallipoli.

NORTHERN—
J. C. Kleinig, Laura—Nabawa.
C. Jaeschke, Wirrabara—Nabawa.
P. Curtin, Beetaloo Valley—Nabawa
F. G. Bartrum, Beetaloo Valley—Waratah.
W. D. Pearce, Gladstone—Ford.
J. J. Gale & Sons, Gladstone—Sword.
N. E. Coe, Gladstone—Dan.
J. S. Gillis, Gladstone—Sultan, Waratah.

SEED WHEAT COMPETITIONS—*continued.*

District. Competitor. Address. Variety.

NORTHERN—*Continued.*

W. M. Neate, Caltowie—Nabawa.
R. W. Batten, Caltowie—German Wonder.
J. E. Lehmann, Caltowie—Free Gallipoli.
R. W. Pearson, Jamestown—Nabawa.

MIDLANDS—

F. D. Lake, Alma—Barunga.
W. H. Brown, Alma—Sword.
F. G. Hannaford, Riverton—Sword.
A. R. Bagshaw, Saddleworth—Nabawa.
G. Hazel, Kapunda—Nugget.
P. McD. Smythe, Salter's Springs—Waratah, Ford.
Mrs. M. Glynn, Riverton—Currawa, Waratah.
C. H. Behn, Riverton—Waratah.
R. W. and L. G. Blatchford, Wirrilla—Waratah.
J. S. Lake, Salter's Springs—Ford.
L. V. Bell, Marrabel—Rance.
F. Coleman, Saddleworth—Rance, Gallipoli.
E. Pleuckhahn, Saddleworth—Pleuckhahn's Selection.
R. F. Kelly, Manoora; Pleuckhahn's Selection.
Frost Bros., Manoora—Gallipoli.
J. Jones, Manoora—Gallipoli.
W. R. Woods & Sons, Wirrilla—Gallipoli.
G. Ashby, Farrell's Flat—Gallipoli.
P. Kean, Farrell's Flat—Gallipoli.
T. Vogt, Saddleworth—Gallipoli.
L. W. Frost, Saddleworth—Dan.
G. Miller, Farrell's Flat—Bena.

TATIARA—

A. E. Grosser, Wolseley—Gallipoli.
H. C. M. Pilgrim, Wolseley—Gallipoli.
F. B. Milne, Bordertown—Gallipoli.
E. P. Vercoe, Bordertown—Gallipoli.
D. R. Milne, Bordertown—Gallipoli.
E. W. & F. Packer, Mundalla—Sword.

MOUNT GAMBIER—

F. L. Koop, Glencoe West—Major.
R. H. Edwards, O.B. Flat—Zealand Blue.

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MOUNT GAMBIER—

A. H. Allen, Compton—Duckbill and Pettingill.

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EARLY SUPERPHOSPHATE EXPERIMENTS.

[By R. C. Scott, Supervisor of Experimental Work.]

To-day the use of superphosphate is so general throughout our farming areas that it is difficult to realise that at one time the value of this fertiliser was not recognised.

It is now just over 50 years since the first series of manurial experiments were commenced, the results from which paved the way for the almost universal use of phosphatic fertilisers in this State. These tests were conducted by Professor Custance from 1882 to 1886 whilst he was Professor of Agriculture and Principal of Roseworthy Agricultural College.

There is no doubt that superphosphate had been used by a few progressive farmers prior to this period, but no records are available showing who first applied this manure in South Australia.

However, the fact remains that the trials inaugurated by Professor Custance were the firs series of organised experiments conducted in the State, and were the means of drawing public attention to the value of superphosphate.

In the light of subsequent events, it is, therefore, of interest to publish a record of these early experiments, together with the comments of the experimenter.

Notwithstanding the results obtained, the practice of applying superphosphate with cereal crops was not rapidly adopted by farmers, and it remained for Professor Lowrie, who succeeded Professor Custance, to demonstrate further its value and popularise the use of superphosphate throughout our agricultural areas generally.

EXPERIMENTS IN 1882.

Following a report submitted to the Government by Professor Custance shortly after his arrival in the State in 1881, it was decided to establish an experimental farm within a convenient distance of Adelaide.

Accordingly, an area of 728 acres, which now comprises portion of Roseworthy Agricultural College Farm, was purchased early in 1882 at a price of £6 per acre, and, amongst other trials, a series of manurial experiments, totalling 46 plots in all, was commenced. This included various classes of manures, mixtures, and soil amendments, together with unusual dressings such as 800lbs. of salt per acre. As much as 10cwts. of superphosphate were applied, whilst the minimum for this manure was 5cwts. per acre.

It is not necessary to record all the results, but the highest yield, namely, 26bush. 40lbs., was obtained from the plot receiving 5cwts. bonedust and 5cwts. Peruvian Guano per acre. The 5cwts. of superphosphate dressing yielded 21bush. 20lbs. comparatively with 10bush. 9lbs. per acre from the no manure plot.

EXPERIMENTS IN 1883.

From the experience gained in the previous year it was possible to abandon some of the manurial experiments, and in all 24 plots were planted. The maximum yield of 23bush. 20bs.. was harvested from the area receiving a dressing of 29 loads of farmyard manure per acre; 5cwts. of bonedust gave 20bush., and 5cwts. of superphosphate 17bush. 20lbs. of grain per acre. The mean return from the no manure plots was 13bush. 40lbs.

EXPERIMENTS IN 1884.

The results obtained in 1884 served to indicate that lighter manurial dressings were preferable to applications in the vicinity of 5cwts. to 10cwts. per acre. In this connection, an application of 2cwts. of superphosphate gave a higher yield than a 5cwt. dressing, whilst similar results were secured in the case of Peruvian Guano and other forms of manures. This was a good rainfall year, and the no manure plots finished well to average 18bush. 10lbs. per acre, comparatively with 20bush. from the area receiving 2cwts. of superphosphate.

EXPERIMENTS IN 1885.

In this season the maximum yield was secured from the 3cwts. superphosphate dressing. This plot returned 22bush. of grain per acre. Next in order of yield was 20bush. from the 4cwts. of Peruvian Guano, whilst the plots which did not receive any fertiliser averaged 12bush. 50lbs. per acre.

SUMMARY OF THE SUPERPHOSPHATE PLOTS.

A summary of the yields so far as the superphosphate dressings are concerned is set out in the following table :—

Year.	No Manure.		Super-phosphate.		Quantity per Acre.
	B.	L.	B.	L.	Cwts.
1882	10	9	21	20	5
1883	13	40	17	20	5
1884	18	10	20	0	2
1885	12	50	22	0	3
Means	13	42	20	10	3¾

Over the four-year period an average dressing of 3¾cwts. of superphosphate per acre led to an increased yield of practically 6½bush. of wheat per acre.

The superphosphate used contained 25 per cent. soluble phosphates, and cost £2 12s. 6d. per ton, free on board, Liverpool, or approximately 4s. per cwt. on the farm in South Australia.

In his reports on the manurial plots Professor Custance made the following remarks :—

1882.—" Undoubtedly, if natural deposits of phosphatic materials and nitrate of soda exist in the Colony, farmers have a means of increasing their wheat crops from the application of these substances."

1883.—" Wheat may be grown under certain conditions with profit to the farmer, one condition being a cheap supply of suitable manure ; that is, manure containing the ingredient deficient in the soil and required by the wheat crop which appears to be chiefly phosphoric acid."

1884.—" It will pay the farmer in this country to use superphosphate, because if it is properly applied it will double his wheat crop."

1885.—" This season the influence of 3cwts. of superphosphate on the wheat crop has been very marked, producing an increase of 9bush. per acre against land unmanured."

1886.—" After numerous experiments carefully conducted during the last four years, I can strongly recommend superphosphate as the cheapest and best manure for the wheat crop. The quantity used per acre should be well mixed with the soil and should not exceed 3cwts. per acre."

" The important question to be considered is the cheap supply of dissolved mineral phosphate on an extensive scale, because I am confident that farmers would use it in large quantities could it be procured for, say, £3 to £4 per ton."

The foregoing particulars show the foundation on which the recommendation for the use of phosphatic fertilisers in South Australia was built up and indicate the far-seeing nature of Professor Custance, who, on the evidence before him, was prepared to state publicly that superphosphate was the cheapest and best manure for the wheat crop.

That this has proved correct is illustrated by the statistical returns which show that for season 1930-31 182,906 tons of superphosphate were applied to cereal crops in South Australia, whilst the area thus manured equalled 90·69 per cent. of the total land cropped in that year.

A CITRUS ROOTSTOCK TRIAL.

[By Geo. Quinn, Chief Horticultural Instructor.]

About seven years ago, when it was finally realised that the piece of land adjoining the Municipal Tramways Depot on Hackney Road, Adelaide, which had been used by the Horticultural Branch of the Department of Agriculture as a demonstration orchard and nursery since 1907, must ultimately be merged into the Tramways premises, it was decided to gradually propagate and transfer the valuable collections of varieties of citrus trees and grape vines to a more commodious area.

Such an area was found in a portion of the Old Woodside House Estate facing the Fullarton to Mitcham Road which bounds the Waite Agricultural Research Institute on its western side. This land immediately adjoins the grounds of the newly established Urrbrae Agricultural High School on the south.

Steps were at once taken to propagate the citrus trees and grape vines, and the writer planned to utilise a portion of the new area by setting out a series of tests of rootstocks for a few of the leading commercial types of citrus fruits as grown in the State collection.

These rootstocks consisted of seedlings raised from citrus trees of the following six species and varieties, each of which had been growing in the Hackney Road plantation for periods ranging from 15 to 20 years. They are as follows :—The Sweet orange (*Citrus sinensis*), the Sour or Seville orange (*Citrus aurantium Linn*), the Trifoliate or Deciduous orange (*Poncirus trifoliata, Raf*) (*Citrus trifoliata, Linn*), Rough Lemon (*Citronelle*) (*Citrus Limonia, Osbeck*), Grape-fruit or Pomelo (*Citrus maxima, var. Uvacarpa Merril and Lee*), the Poorman orange (*Botanical identity not known*).

The commercial varieties of citrus trees worked upon these stocks were :—Washington Navel orange, Valencia Late orange, Marsh Pomelo or Grape-fruit, Lisbon (Improved) Lemon, Dancy Tangierine.

The procedure followed in raising the seedlings was as follows :—The seeds were taken from fully ripened fruits which had been gathered, thrown into a bucket and allowed to soften in the process of decomposition. During their extraction from the pulp, all of the small or shrivelled seeds were discarded, and only those plump with endospermic content retained. These were sown almost at once in boxes filled with free, sandy loam containing a high percentage of pulverised and decayed animal manure.

The seeds of the Sweet orange were collected from the fruits of a vigorous seedling tree, one of several which had been permitted to remain unworked in an old nursery bed until they had borne fruits. The fruits of this tree were of excellnt quality, but the usual tendency of seedling Sweet oranges to produce abundance of seeds was noted in these. Those of the Sour or Seville orange were taken from fruits of a variety which has always been known in this State as the Common Seville, as distinct from several varieties which produce larger and more oblate shaped fruits, known locally as Flat Sevilles, one of which produces Navel fruits only.

These fruits are grown exclusively for marmalade making. It is claimed by local nurserymen that the Common Seville will reproduce itself " true " from seedlings, but the degree of accuracy of this contention has not been fully established by scientifically controlled experiments.

The Grape-fruit seeds were taken from fruits produced by a matured tree of the well-known Triumph variety of Pomelo or Grape-fruit. The Rough Lemon which produced the fruits used for seed purposes by us would appear also to have some claim to the characteristic of reproducing true-to-type ascribed to the Seville, and for reasons referred to at a later stage, this seems highly probable. In this climate, if the fruits are not taken from the trees of Rough Lemon until the summer is over, the seed in many of them will germinate either before they fall or immediately afterwards, whilst they are laying undecayed on the ground.

VINE PLOT.

FULLARTON TO MITCHAM ROAD.

Position in Row.

35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	Rows
																														36					
																							L	S	P	T	G	O	L	S	P	T	G	O	1
																													Dancy's						
																							P	G	O	S	T	L	P	G	O	S	T	L	2
																													Tang ierine						
																							G	T	L	O	P	S	G	T	L	O	P	S	3
											L	S	P	T	G	O	L	S	P	T	G	O	L	S	P	T	G	O	L	S	P	T	G	O	4
														36						36						36						36			
											P	G	O	S	T	L	P	G	O	S	T	L	P	G	O	S	T	L	P	G	O	S	T	L	5
														Valencia						Lisbon						Washington						Marsh's			
											G	T	L	O	P	S	G	T	L	O	P	S	G	T	L	O	P	S	G	T	L	O	P	S	6
														Late						Lemon						Navel						Grape Fruit			
											S	O	G	P	L	T	S	O	G	P	L	T	S	O	G	P	L	T	S	O	G	P	L	T	7
														Orange.						(Improved).						Orange.									
											O	P	T	L	S	G	O	P	T	L	S	G	O	P	T	L	S	G	O	P	T	L	S	G	8
											T	L	S	G	O	P	T	L	S	G	O	P	T	L	S	G	O	P	T	L	S	G	O	P	9

Central Road.

WEST.

KEY TO PLANTING CITRUS STOCK TRIAL—EXPERIMENT ORCHARD, FULLARTON (Urrbrae), 1931.

Varieties under Test—

Marsh's Grape Fruit.
Washington Navel Orange.
Lisbon Lemon (Improved).
Valencia Late Orange.
Dancy Tangierine.

Stocks Used—

O = Orange (sweet).
L = Lemon (rough).
S = Seville (sour).
T = Trifoliata (deciduous).
G = Grape Fruit (Pomelo).
P = Poorman (Orange).

In the case of the Trifoliate orange as the winter season approaches, the foliage yellows to its fall and the pale yellow fruits are shed more or less along with the foliage. The seeds of any of these fruits which may be dug lightly under the soil will germinate freely in masses direct from the pulp, the young plants resembling a mass of suckers just emerging from a roughly grubbed tree. In so far as the so-called Poorman orange is concerned, the writer has thus far utterly failed to trace its botanical origin. The majority of the seedlings are very vigorous and produce bold, fleshy, dark-green foliage, with widely winged petioles to the leaves. Others, however, have leaves not larger than the average Sweet orange or, perhaps, it would be more correct to say average Mandarin orange tree.

Cultivated trees produce fruits of destinctly variable sizes, varying from medium to very large. They are all oblate in shape, approximately to the outline of a Marsh Grape-fruit, but the outer rind ranges from smooth to pebbly and of a pale orange to rich reddish orange color.

The pulp has a deep orange color when ripe—deep as the richest colored Sweet orange. It has abundant seemingly shrivelled seeds, plenty of juice pulp possessing a combination of acid, sugary, and bitter flavours. It is certainly sweeter than any grape-fruit known to the writer. The white blanket-like lining of the rind is very bitter as is the rind itself. The fruit has in the past been used for marmalade purposes only, but during recent years it has been more freely eaten in a similar manner to the grape-fruits. Selected fruits have been shipped to London labelled "Golden Pomelo." The oil in the foliage emits a distinct odor from that of either the Seville, Sweet, or Mandarin oranges, or Grape-fruit. The trees grow to a rounded form, and crop freely. The bark on the older limbs or trunks exhibit a pecular roughness not noted in any other citrus species grown in our State collection. There is a seedless type grown in this State, and I am advised this is the form of Poorman orange commonly grown in the northern part of New Zealand.

When the seedlings of these species and varieties had been grown for about one year in the seed boxes, they were set out in rows in a nursery nearby where the soil is composed of a sandy, alluvial deposit over deep waterborne layers of gravel and stones. During the progress of this work, the distinctly weakly plants were discarded. This precaution together with the seed selection previously referred to, was deemed to assist in securing greater uniformity in the vitality of the rootstocks. In the process of elimination of the poorer plants, no attempt was made to distinguish between those which were seemingly of a stunted habit, and those which, owing to having the misfortune to occupy an unusually crowded space in the seed-box, or others which owing to the unevenness of the soil surface in the seed-box, were subjected to the effects of dryness to a greater degree than the majority. Whilst there can be little doubt that the larger healthy seedlings must lend themselves to the production of trees sufficiently developed and ready to set out in the grove at least a year earlier than is possible in the case of the more backward ones, still, the latter, if not seriously impared and permanently stunted by hardship, need not necessarily be discarded as inherently unsuitable. That this process of elimination of the weaker seedlings is not generally adopted in commercial nursery practice is a well known fact. On the other hand there is a too common tendency to set out every plant which appears to have a chance of surviving, and trusting to circumstances for the ultimate production of a budable stock from it, even although several seasons may elapse before this stage in its development be reached.

The subject of securing the utmost uniformity in the rootstocks used in propagating deciduous fruit trees, has been under searching investigation by scientifically trained men in a number of the leading fruit-growing countries of the world for some years past, and of later years attention has also been directed on similar lines towards those types of citrus used in developing citrus trees for commercial plantings. In some countries the research has turned toward vegetatively reproducing desirable commercial varieties by means of segmentation. Cuttings, layers, root grafts, marching processes, and aerial layers (Marcottage) have each received attention, using all the tested methods adopted by horticulturists. Scientifically trained research workers have on the other hand, in hope of solving the difficulty, directed their efforts towards elucidating that peculiar phenomenon of reproduction termed by botanists Polembryony which is characteristic of many members of the citrus family. As the term implies, a single seed of these citrus trees, when submitted to germination tests, may give rise to several independent plants. Although Leeuwenhock, as early as 1729, had announced the discovery that two embryos had sprouted from a single seed of an orange, the subject was apparently not deemed of any moment until Strasburger revived and established the evidence of the polyembryonic nature of citrus seeds in 1878. These facts were accepted by the scientific world, but it has remained for the research workers of recent years, more particularly Webber of U.S.A., and Toxopeus in Java, to indicate how these facts of science may lead up to developments of great commercial value to the citrus growing industry of the world. These research workers have pointed out that whilst a single citrus seed may give rise to from one to ten sprouts, only one of these can be claimed to be the direct result of the impregnating action of pollen. The remainder, though their development is suspected to be due to the stimulus of fertilisation of one egg cell, were not actually produced by the fusion of two distinct sexual elements. In other words they partake of the nature of buds from the female parent plant, and not from the fusion of male and female elements of a single flower, or from flowers of two distinct trees. It has been further indicated that as it is possible to distinguish the seedlings arising from the sexually developed embryos, by their elimination from the seedbed a much greater uniformity of constitution and character may be attained in the seedling rootstocks. The principal investigator, Toxopeus of Java, announced that such generative offspring from certain citrus hybrids, *viz.*, of *C. nobilis* (Mandarin orange), *C. aurantium* (Seville orange), *C. grandis* (Grapefruit), *C. aurantifolia* (Sweet lime), *C. medica* (Citron), sown in December, 1928, could be readily picked out in July of 1929. Further, in respect to his research on the seeds of Rough Lemon (*Citronelle*) he reports that only 4 per cent. of the sprouts are of generative origin, and that the seedlings arising therefrom are invariably weak, show very poor growth, and are readily distinguishable in the seedbed.

Although the above-mentioned facts were mainly published since the initiation of the small rootstock trial herein described, it is considered quite possible that many of the generatively developed seedlings were eliminated in the weeding-out process above described as operating at the rowing out of the seedlings of the different stocks, or were side-stepped in the subsequent discarding of the backward seedlings as practiced when the budding was in progress.

As it was not possible to secure and sow the seeds of all of the varieties or species used as rootstocks in these trials during the first season, the budding of all stocks could not be performed in the same summer. In fact, owing to some fatalities since the plots were planted, a few gaps have yet to be refilled. In consequence of these difficulties, some of the worked trees had to be retained in the nursery a year or more longer than others. This procedure was deemed more desirable than to permit the earlier seedlings to continue to grow on unworked so that the whole of the range of stocks might have been budded simultaneously.

The budwood of the various scion varieties was, in each instance, selected from one tree of that particular kind. All of these trees had been cropping in our State collection over a considerable number of years, during which time an annual record had been made of the respective bearing capacity of each one and of the nature of the fruit borne by it. The buds were mostly taken from twigs which carried growing fruits upon their terminals at the time of cutting the budwood.

A great majority of the trees of each variety as worked on the various rootstocks was planted out in the Urrbrae orchard during October, 1931. The attached sketch plan indicates the randomized system of allotment followed. All of the trees are set out on the square system 18ft. apart. The plot of Dancy Tangierine is rectangular, those devoted to the Marsh Grapefruit, Washington Navel orange, Lisbon (Improved) lemon, and Valencia Late orange, are square. Each plot carries thirty-six trees, representing six trees worked on each of the six respective rootstocks. The letters printed over the surface of each plot are the initial letters of the names of the various rootstocks set in those particular positions, as indicated on the key to the plan of planting adopted.

It may be mentioned in conclusion that the soils and subsoils in these plots appear to be of more than of average uniformity of texture and composition, but it is not deemed to be first-class land for profitable citrus culture. The surface of the land is almost level. Soil profiles examined at various points over these plots indicate a surface soil composed of moderately friable, reddish clay loam to a depth of from 12 to 14 inches. Under this a thin layer of about 4in. of sandy reddish clay is found. Below this rests not less than 36in. of dark reddish clay of a moisture retentive character. Beneath this depth the clay is intermixed with small scattered irregular calcareous nodules and other waterworn stones. This latter stratum when reached was found by testing to permit a steady percolation of water through it.

The preparatory processes applied to this land prior to planting consisted of ploughing and dressing the broken surface with gypsum at the rate of two tons per acre. A year later it was subsoiled by using a large heavy type of subsoiler drawn by a powerful caterpillar tractor. The knife of this implement penetrated to depths varying from 16 to 20 inches below the surface. The field was then cross-subsoiled at 3ft. intervals to cut out the subterranean ridges left in the first operation. In the following spring holes about 2ft. square were dug for the reception of the trees. In the centre of each hole, a bore 5in. in diameter was sunk into the drainage stratum previously referred to, and filled with coarse road metal. The broken soil in the bottom of the square tree hole was then enriched by being mixed with several pounds of bonedust fertiliser. After this the trees, each with its natural ball of soil adhering around the roots, were set in place, filled around with surface soil, soaked thoroughly with water, and thus settled down into its permanent position. The success of this procedure was indicated by the fact that only three trees died as a direct result of the transplanting operation.

The writer wishes to record his appreciation of assistance so willingly rendered by Mr. C. J. McCarty, formerly gardener in charge of the Hackney Road orchard and nursery for many years, who skilfully carried out most of the propagational work outlined herein. Thanks are also due to the Manager of the Adelaide and Blackwood State orchards (Mr. R. Fowler and his staff) for care displayed in transporting the nursery trees some four miles, and replanting them on the Urrbrae site under the writer's direction.

RESULTS OF WHEAT CROP COMPETITIONS.

SEASON 1932-33.

Judged by E. S. Alcock (District Agricultural Instructor).

Position.	Name and Address.	Variety.	Apparent Yield.	Freedom from Weeds.	Freedom from Disease.	Trueness to Type.	Evenness of Crop.	Total.
		Maxima—	35	25	20	15	5	100
		TATIARA DISTRICT.						
1	Pilgrim, H. C. M., Wolseley	Gallipoli (2) ..	32	24	19	15	4½	94½
2	Grosser, R. A., Wolseley	Gallipoli	33	23	18	15	3½	92½
3	Packer, E. W. and F., Mundalla	Sword	31	25	18	14	4	92
4	Burbridge, J., Wolseley	Gallipoli	34	22	16	14	5	91
4	Milne, D. R., Bordertown	Gallipoli	32	23	18	14	4	91
6	Durbridge, J., Wolseley (2)	Gallipoli	33	23	17	13	4	90
7	Milne, F. B., Bordertown	Gallipoli	31	23	17	14	3½	88½
7	Pilgrim, H. C. M., Wolseley	Gallipoli (1) ..	30	22	18	15	3½	88½
7	Vercoe, E. P., Bordertown	Gallipoli	32	22	17	14	3½	88½
10	Grosser, A. E. J., Wolseley	Gallipoli	27	25	18	15	3	88
11	Butler, G. D., Wolseley	Gallipoli and Ranee	30	23	17	13	3	86
12	Vercoe, L. E., and J. McDonald, Bordertown	Gallipoli	30	22	17	13	3	85
13	Orton, H. W., Wolseley	Daphne	30	20	17	13	3	83
13	Smith, J., Bordertown	Gallipoli	31	20	17	12	3	83

RAINFALL FOR 1932.

ABOVE AVERAGE IN SETTLED AREAS.

By E. Bromley, Divisional Meteorologist, Adelaide, S.A.

Mainly as a result of heavy rain during the early part of the year the total rainfall for 1932 was with a few exceptions above the average throughout the Settled Areas. For the most part the surplus ranged from about 2in. to 5in., but a number of stations, chiefly over the Western Districts, Mount Lofty Ranges, Lower Murray, and Lower South-East, received from 6in. to 8in. above normal.

The heaviest excesses were at Mount Barker, 1,327 points; Uraidla, 1,183 points; and Tailem Bend, 949 points.

In the Far North-West and at other scattered places in the pastoral country the yearly falls aggregated from 2in. to 4in. above normal, but otherwise there was a slight deficiency.

The total rainfall at a few places, chiefly north of Lake Eyre, was less than 5in., while from Oodnadatta (389 points) it continued dry to Charlotte Waters where only 332 points were registered.

The year's totals over most of Central Australia were above normal, but in North Australia they fluctuated from a deficiency of 728 points at Powell Creek to a surplus of 609 points at Brock Creek.

The aggregate of 5,656 points at Darwin was 372 points below normal.

At Adelaide the total of 2,504 points was 390 points above the 94-year's average, and exceeded the 1931 figures by 278 points.

The Settled Areas.

Although the first part of January was, on the whole, cool, the second half was marked by prolonged and at times intense heat away from the coast. Some stations recorded shade readings of 115 degrees or over on several days with a maximum of 119·4—the highest on record for South Australia—at Port Augusta on the 27th. Very little rain fell during the month.

In marked contrast February was exceptionally cool and wet.

At Adelaide it was the coolest February on record.

The bulk of the rain, which aggregated from two to four times the average, fell during the first fortnight, mainly as the result of monsoonal activity.

March opened with a rather severe heat wave,but, on the whole, conditions were normal until near the close, when a cold snap occurred accompanied by severe squalls and rain on the 26th, the falls being heavy in the Central, North, and South-East parts.

This partial break in the season was completed early in April, when widespread rains marked the passage of a disturbance of monsoonal origin that passed across the State. Further rainstorms followed, the month being generally wet and cold with heavy rainfall excesses.

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Due to anticyclonic control May was, on the other hand, chiefly fine and mild, but opportune rains occurred in the second half.

The early part of June was mostly fine with mild days but cold frosty nights. Wintry conditions, however, definitely set in on the 11th, when a well-placed "Low" brought probably the best rain for the season. Then followed a fortnight of cold, squally, and showery weather, under the influence of persistent low pressure waves.

Except for brief fine intervals, July was unsettled with frequent rain, but as the falls were chiefly light to moderate in character, totals were somewhat below average in Western and Upper North districts.

More good rains took place in August, particularly during the first half. A cold snap with some snow occurred at the middle of the month followed by a week's fine weather with many frosts and fogs.

Mainly due to persistent monsoonal activity further useful rains fell in September except over the Upper Murray and adjacent districts.

Tropical depressions, which at times developed cyclonic formation, brought frequent rain accompanied by thunderstorms in October and the weather was very cool and cloudy. The registrations in the Upper Murray were again light, but elsewhere on the whole the month's rainfall was slightly above normal.

The greater part of November was fine and cool but a moderate heat wave occurred from the 26th onwards with some scattered rain and thunderstorms.

Rapidly moving systems in December prevented any lengthy heat waves, and although there were a number of warm to hot days, conditions were for the most part fine and cool.

The bulk of the rainfall occurred about the middle of the month when light to moderate falls were recorded generally with some heavy amounts over the Murray and adjacent districts—maximum 170 points at Meribah.

PASTORAL AREAS

Owing to persistent monsoonal activity the pastoral areas, generally speaking, experienced a fairly good year.

Little or no rain fell during January, but in the following month useful and chiefly moderate to heavy amounts were gauged except in parts of the Far North. In the next two months there were also some moderate to heavy falls, mainly in April, otherwise the rains were light.

May was wet, several stations receiving over 2in.

Apart from a few heavy amounts in the North-West in June and July these months were dry.

The next four months were, on the whole, satisfactory with moderate to heavy rains. There were, however, one or two exceptions, viz., a deficiency in the Far North in August and a dry October in the North-East.

Apart from a few moderate to heavy falls in the Far North-west December rains were only very light.

CENTRAL AND NORTH AUSTRALIA.

Although moderate to heavy rains occurred over northern rivers during January and February there was general deficiency of several inches and in Central Australia the falls were only light.

March, on the other hand, was a wet month with heavy rains everywhere above average—maximum 1,370 points at Darwin.

There were a few heavy falls in April, otherwise the gaugings were chiefly light to "nil." Except in the extreme south heavy rains occurred in Central Australia in May, but on and near the coast it was dry.

Apart from some heavy amounts near the coast in June there was little or no rain during the next four months.

Splendid rains took place in October between Barrow Creek and Alice Springs but were light elsewhere.

November falls were moderate to heavy north of Daly Waters, but south from this station the totals were all under half an inch.

December was also dry in Central Australia but wet and above average in North Australia.

North from Katherine the aggregate exceeded 10in. with a maximum of 1,405 points at Darwin.

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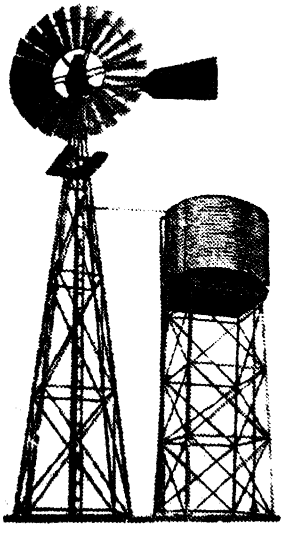

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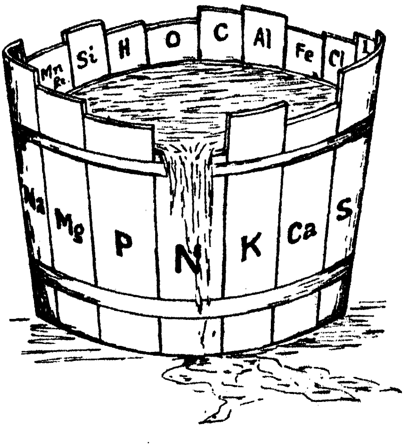
FERTILISERS AND SOIL AMENDMENTS.

By W. J. Spafford, Deputy Director of Agriculture.

INTRODUCTION.

The use of the excrements of animals as manure goes back to the dim ages, and the value of such substances as marl, chalk, burnt clay, &c., for improving the cropping powers of the land has been well known for many centuries. The very great increase in the growth of plants at those spots where the droppings of animals lodged, would have been noticed, and would have eventually led to the use of applications of farmyard manure, although no thought would have been given to the mode of action of the materials used. Once having realised the value of animal droppings for increasing the yields of crops this knowledge would have been passed on from generation to generation, as has been the usual procedure in agricultural matters. Much the same thing would have applied where earthy substances

"THE LAW OF THE MINIMUM."



[From "Nitrate of Soda," by Alfred E. Stephen.

Although the number of substances necessary for the full development of plants is limited, healthy growth is not possible if any of these substances be kept from a plant. Each kind of plant requires the plant foods in different proportions, and an excess of one plant food does not make up for a shortage of another. A soil may be a poor crop producer although rich in all plant foods except one, and making good the shortage may render the soil a very fertile one suitable for the production of heavy crops.

with the power of ameliorating soils were accidently spread on the surface of the land. Although several natural substances had been used by farmers for a very considerable period, there was a long time during which very little, if any, advancement of knowledge was made, and progress in manuring was almost at a complete standstill. Indeed it was not until the early part of the 19th century that sufficient information had been gathered to permit of an understanding of how manures acted, and then, of course, many of the explanations offered were only partially correct.

The study of the science of chemistry made progress in manuring possible, because it was able to show what plants were composed of, and where they obtained the materials to make up their substance. Learning how to analyse plants and soils led, step by step, towards the manufacture and use of the so-called *artificial manures*, which have supplemented, and so largely replaced, the manures derived from natural sources. The very great increase in the World's population, which has been one of the outstanding features of the last century, has meant that the amount of foodstuffs to be raised from the land has increased proportionately, and although much of this extra food has been derived from new tracts of country, a considerable quantity has been produced by the use of artificial manures on land which has already been tilled for a long time.

DEFINITION OF MANURING.

Manuring at one time meant the addition of anything which led to the amelioration of the land, but nowadays it is more general to consider a *manure* to be a substance which makes good a shortage of a mineral plant food, whilst any material that improves the mechanical condition or texture of the soil, or corrects the excessive acidity or alkalinity, is known as a *soil amendment*. For instance, superphosphate which supplies phosphorus to the crop is a *manure*; lime, which improves the texture of the land, is a *soil amendment*; whilst farmyard manure is both a *manure* and a *soil amendment*.

To enable an understanding of the economical use of these aids to crop-growing, some knowledge of the requirements of crops, and how they are obtained, is necessary.

FOOD REQUIREMENTS OF PLANTS.

Chemists find when they analyse plants that all of them contain carbon, hydrogen, oxygen, sodium, magnesium, sulphur, chlorine, iron, silica, manganese, nitrogen, phosphorus, potassium, and calcium, and although other substances are sometimes found, none of the above is ever absent, and so it is natural to consider that all of them are essential to plant growth. With the possible exception of silica, experiments confirm this, for if any of these substances be kept from a plant, it either does not grow at all, or else makes but a very weakly plant.

COMPOSITION OF PLANTS.

The substance of all plants can be separated into water and dry matter, and from an agricultural point of view the dry matter can be further split up into organic matter and mineral matter. The composition of plants may be expressed as—

$$\text{Plants} \ldots\ldots \begin{cases} \text{Water.} \\ \text{Dry matter} \ldots\ldots \begin{cases} \text{Organic matter} \\ \text{Mineral matter} \end{cases} \end{cases}$$

If the materials forming the substance of plants be separated into their component elements the result can be presented as—

- Plants ......
  - Water ....
    - Oxygen
    - Hydrogen
  - Dry matter......
    - Mineral matter ....
      - Oxygen
      - Sodium
      - Magnesium
      - Sulphur
      - Chlorine
      - Iron
      - Silica
      - Manganese
      - Phosphorus
      - Potassium
      - Calcium
    - Organic matter ....
      - Carbon
      - Oxygen
      - Hydrogen
      - Nitrogen
      - Sulphur (generally)
      - Phosphorus (sometimes)
      - Iron (in a few cases)

The proportion of the various component parts of plants have been determined by many investigators, and it is easy to calculate the quantities present in a crop, when the weight of that crop is known. In the following table the proportions and quantities found in several representative crops are set out :—

TABLE I.—*Composition of Various Crops.**

Crop.	Analysis.			Weight per Acre.			
	Water.	Organic Matter.	Mineral Matter.	Crop.	Water.	Organic Matter.	Mineral Matter.
	%	%	%	Tons.	Lbs.	Lbs.	Lbs.
Oats	76·8	21·4	1·8	8	13,763	3,835	322
Barley	68·6	29·4	2·0	7	10,756	4,610	314
Maize	82·8	15·7	1·5	20	37,094	7,034	672
Grass	80·0	18·0	2·0	6	10,752	2,419	269
Red clover	81·0	17·4	1·6	10	18,144	3,898	358
White clover	81·5	16·4	2·1	5	9,128	1,837	235
Lucerne	76·0	21·7	2·3	15	25,536	7,291	773
Peas	84·6	14·0	1·4	7	13,265	2,195	220
Rape	85·9	12·8	1·3	15	28,862	4,301	437
Mustard	85·1	13·5	1·4	10	19,062	3,024	314
Potatoes	75·0	23·9	1·1	6	10,080	3,212	148
Turnips	91·5	7·8	0·7	20	40,992	3,494	314
Swedes.................	87·8	11·3	0·9	20	39,335	5,062	403
Mangels	88·0	10·9	1·1	30	59,136	7,325	739

* Calculated from Kellner's Tables.

WATER IN PLANTS.

The outstanding features brought out by these figures are—

(*a*) the enormous quantity of water present in ordinary agricultural crops; and

(*b*) the differences in the amount of water found in the various kinds of plants. The amount of water shown as being present in the crops at the time of harvesting them is very great, but it is only a very small proportion of the quantity utilised by the plants during their growth. It is well known that the roots of plants are constantly pumping water from the soil, which passes up the tissues of the plants and evaporates through the breathing pores of the leaves and other sappy portions. This process is continuous, and during the life of the plant the quantity of water passing through its tissues is tremendous, being particularly so in the case of those plants which make their growth in the summer, when the evaporation is very high. It is in this stream of water that the mineral matters necessary for the growth of the plants are brought from the soil into the tissues of the plants. The amount of moisture required to pass through plants to enable them to make good growth and reach full maturity has been measured by many agricultural investigators in several different countries, and it has been found that in a climate such as ours the amount of water which passes through the tissues of the plants, for every pound of dry matter formed, varies from 300lbs. to 500lbs. for cereals, up to something about 800lbs. for potatoes.

If we take the figure of 400lbs. and apply it to a 3-ton crop of cereal hay containing 10 per cent. of moisture, we will find that to produce the 6,048lbs. of dry matter present 2,419,200lbs. of water must have passed through the tissues of the plants. This is 241,920galls., or the equivalent of about 10¾in. of rain per acre.

It can easily be realised that if so much water is required for every pound of dry matter formed, heavy yields of our cultivated crops are dependent upon a plentiful and continuous supply of water. Where the rainfall is limited, as in so much of South Australia, this adequate supply of moisture for the production of big crops will depend largely on very thorough cultivation methods being practised, so as to utilise to full advantage as much as possible of the rainfall received.

ORGANIC MATTER OF PLANTS.

Next in importance to the water of plants, in-so-far as quantity is concerned, is the organic matter. This portion of plants is composed of carbon, hydrogen, oxygen, and nitrogen; it usually contains some sulphur, sometimes there is phosphorus present, and occasionally some iron. It has been estimated by the German Scientist, Knop, "that if all the species of the vegetable kingdom, exclusive of the fungi, were fused into one mass, the ultimate composition of the dry matter of this mixture would be the following:—

Table II.—*Average Composition of the Dry Matter of a Mixture of all of the Higher Plants.**

	%		%
Carbon	45·0	Organic matter	95·0
Oxygen	42·0		
Hydrogen	6·5		
Nitrogen	1·5		
Mineral matter			5·0

*"Feeding of Animals"—W. H. Jordan.

As is to be readily seen the dry matter of plants is almost wholly composed of organic matter, and carbon and oxygen constitute the great bulk of the organic matter. This preponderance of carbon and oxygen exists with all of the cultivated crops, and, although the actual percentage varies with each separate kind of plant, the differences are not very great, except in those few cases of plants which have the power of collecting an abnormal proportion of mineral matter. That this is so can be seen in the following table where the analyses of the dry matter of a few well-known crops are shown :—

TABLE III.—*Dry Matter of a Few Crops.**

	Carbon.	Oxygen.	Hydrogen.	Nitrogen.	Mineral Matter.
	%	%	%	%	%
Wheat	46·1	43·4	5·8	2·3	2·4
Wheat straw	48·4	38·9	5·3	0·4	7·0
Clover hay	47·4	37·8	5·0	2·1	7·7
Fodder-beet	42·8	43·4	5·8	1·7	6·3
Fodder-beet leaves	38·1	30·8	5·1	4·5	21·5

* " The Feeding of Animals "—W. H. Jordan.

MINERAL MATTERS IN PLANTS.

From the point of view of quantity present the mineral matters are only of minor importance, and total such a small amount in most plants that in the dry matter of the mixture of all of the higher plants Knop estimated that the mineral matters would not exceed 5 per cent. of the whole. These mineral matters, together with the water and nitrogen, are what the plants take from the soil to help build up their tissues, and, although the amount collected is not very great, it is nevertheless quite essential to plant growth. It is not only necessary for plants to get sufficient total mineral matter, but they must get enough of every individual one they require, otherwise full growth cannot be made. A plentiful supply of one of the minerals required does not make up for a shortage of any other of the other essential elements.

Plants cannot utilise equal amounts of the various minerals necessary to their growth, and the following figures show the percentage amounts of some of the most important of the essential mineral matters taken up by some of the well-known crops. They also show how different are the requirements of the various crops for any of these mineral matters :—

TABLE IV.—*Percentages of Some Mineral Matters in Various Plants.**

Plant.	Potassium.	Sodium.	Calcium.	Magnesium.	Iron.	Phosphorus.	Sulphur.
	%	%	%	%	%	%	%
Apple	0·43	0·28	0·04	0·08	0·01	0·09	0·04
Gooseberry	1·09	0·25	0·30	0·12	0·11	0·29	0·08
Strawberry	0·59	0·72	0·35	—	0·14	0·21	0·04
Orange	0·93	0·31	0·54	0·15	0·03	0·15	0·05
Sugar Beet	1·69	0·25	0·17	0·18	0·03	0·20	0·06
Sugar Beet Leaves	3·24	1·52	2·15	1·02	0·06	0·31	0·32
Turnip	3·02	0·59	0·61	0·18	0·05	0·44	0·36
Turnip Leaves	2·26	0·82	2·74	0·28	0·13	0·37	0·44
Cabbage	3·57	0·58	0·84	0·21	0·03	0·50	0·53
Cauliflower	3·07	0·37	0·33	0·19	0·06	0·74	0·44
Onion	1·49	0·10	0·86	0·15	0·08	0·40	0·12
Green Maize †	1·78	0·19	0·72	0·39	0·10	0·26	0·07

* (Except Green Maize) " Soil Fertility and Fertilizers," J. E. Halligan.
† " Feeding of Animals," W. H. Jordan

DISTRIBUTION OF THE MINERAL MATTERS IN PLANTS.

The mineral matters to be found in plants are not distributed evenly throughout the various parts of the plants. The mineral matters dissolved in the soil moisture are carried to the leaves of the plant, where they combine with the other plant foods, and are then converted into plant tissue. The leaves being the manufactories of the plant are much richer in mineral matters than either the roots or the seeds.

Immature plants are generally much richer in mineral matters than those which are older. Most annual plants collect a very large proportion of the total quantity that they will eventually contain of some mineral matters while they are still young. It is stored up to be converted into plant tissue later on. Because of this higher content of mineral matter, young plants are generally better foodstuff for animals producing milk than are more mature plants, but on the other hand very young plants, again because of their high content of mineral matter, are more liable to scour grazing animals than are those which have made greater growth.

WHERE PLANTS GET THEIR VARIOUS FOODS.

Nearly all plants start from a seed, and as in most cases the seeds are very small and contain but little material of any kind, it can be readily realised that practically all the mass comprising a plant is collected from somewhere after the small supply of food contained in the original seed is used up. The same is equally true for plants that were propagated from cuttings, tubers, bulbs, &c.

The principal constituent of plants—*carbon*—comprising as it does about 45 per cent. of the matter of plants, is obtained from the air.

Oxygen, of which plants contain nearly as much as they do of carbon, is obtained mainly from water and air, and to a lesser extent in combination with other substances.

Hydrogen, which comprises about 6 per cent. of plants, is secured mainly from water.

Nitrogen is collected from the air, stored up in the soil, and is taken by plants through their roots.

The *mineral matters*, which are the other materials used by plants to build up their substance, are all secured from the soil.

HOW PLANTS GET THEIR VARIOUS FOOD SUBSTANCES.

Plants get much of their necessary food from the soil by the roots pumping up the soil moisture containing some of the foods in solution, but they also get a good deal of their requirements from the air, by breathing the atmosphere in, through pores scattered over their growing portions.

CARBON.

In nature carbon is found as charcoal, graphite, and diamonds, and in an impure form as coal. It is also found in combination in all organic matters. When combined with oxygen it forms gases, the most common of which is carbonic acid gas, a regular supply of which is present in the air in the proportion of about one part of carbonic acid gas to 10,000 parts of air. It is from the carbonic acid gas of the air that this important part of plants, the carbon, is obtained. In the presence of sunlight, the green parts of plants have the power of absorbing the carbonic acid gas, and retaining the carbon which it contains.

All the higher animals breathe in air, some of the oxygen in which is used in the combustion of the food eaten, and carbonic acid gas is breathed out. All combustion of organic matter containing carbon, such as fires, lights, decompositions, fermentations, &c., also give off carbonic acid gas, and these are the main sources that keep up a constant and fairly regular supply of carbonic acid gas in the atmosphere.

OXYGEN.

Oxygen is a gas, which is present in the atmosphere in simple admixture with nitrogen and a small quantity of other gases, and it occupies about one-fifth by bulk of the atmosphere. It is found in combination in many substances, the

[From "Nitrate of Soda," by Alfred E. Stephen.

BREAKING LARGE LUMPS OF CALICHE.

In Chile, South America, the principal material in the nitrate of soda deposits is known as Caliche, which substance is in a more or less solid mass a few feet below the surface of the ground. Explosives are used to break up the material, and the good blocks are hand-picked from the mass. . The illustration shows the size of some of the recently blasted blocks of Caliche, and the need of further breaking up before they can be transported to a factory.

[From "Nitrate of Soda," by Alfred E. Stephen.

BLASTED AND RE-BROKEN CALICHE READY FOR TRANSPORT.

The illustration shows the extent of a nitrate of soda field, and the large amount of Caliche blasted out at the one time from a long semi-circular trench. Most of the large blocks have been re-broken into sizes convenient for hand-picking and transport to the refinery.

principal one of which, from the growing plant's point of view being water, where the oxygen is combined with hydrogen. Oxygen forms about eight-ninths of water by weight. Plants secure oxygen from the water collected by their roots, by absorbing it by their leaves in the absence of sunlight, and through their growing roots at all times.

HYDROGEN.

Hydrogen is a gas which is also found in combination with many other substances, but rarely in the free state. It is commonly found combined up with oxygen, as water, of which substance it forms about one-ninth by weight. Water is constantly passing through the growing plant, from roots to leaves, and most of the hydrogen required by the plants is as water. Any hydrogen wanted by plants, other than in water, can be secured by splitting up the water.

NITROGEN.

The atmosphere consists of a mixture of gases of which nitrogen forms about four-fifths of the whole (77·98 per cent.), and it is there found in the free state. Although nitrogen is so abundantly present in the free state and in actual contact with plants, they have no power of collecting it as a gas, and it must be combined with other substances before plants can absorb it. The nitrogen is brought into the soil, forms combinations with some of the mineral matters with which it comes in contact, is converted into nitrates, which dissolve in the soil moisture, and this solution is absorbed by the roots of plants. As far as we now know plants can only utilise nitrogen if combined with other substances in the form of nitrates, and no matter what form it is in when it reaches the soil it must be changed to a nitrate before it is available to plants.

Nitrogen is brought to the soil in several different ways. Every time that there is an electrical disturbance in the atmosphere some of the nitrogen present is combined up with other substances, and so whenever rain falls appreciable quantities of nitric acid and ammonium salts are carried into the soil (from 4lbs. to 15lbs. nitrogen per acre). Dead animals and plants return to the soil large quantities of nitrogen which formed part of their tissues. Living animals and plants, insects, worms, &c., are also constantly enriching soils with nitrogenous debris.

Leguminous plants, such as peas, beans, clovers, lucerne, &c., have living on their roots bacteria which collect nitrogen directly from the atmosphere. The legumes and the bacteria live in symbiosis, *i.e.*, the two form a strict partnership, each helping the other. The bacteria live in nodules on the roots of the leguminous plants, using some of the sap manufactured by them, and they collect nitrogen from the atmosphere for their own use, give some to their host plants, and any surplus collected, and the nitrogen in the dead bacteria, is stored in the root nodules. Large quantities of nitrogen are transferred from the atmosphere to the soil in this way by practically all well-grown leguminous crops.

In the surface layers of all soils, and particularly in cultivated soils, there are to be found myriads of bacteria possessing the power of extracting nitrogen directly from the air, which they leave behind in the soil when they die. The quantity of nitrogen collected from the air and stored in the soil by these bacteria can be very considerable, particularly when the land has been worked as bare fallow. At the Waite Research Institute where soil samples are taken regularly from plots receiving various cultivation treatments, it was found in March, 1931, that the soil taken from a bare-fallowed plot contained 127·8lbs. of nitrate-nitrogen per acre, most of which was due to the activities of the soil bacteria. That this is an enormous quantity will be realised when it is remembered that it is equal to the amount of nitrogen supplied in 639lbs. of sulphate of ammonia containing 20 per cent. nitrogen.

Methods have been devised for the counting of the organisms in the soil, and although at present the counts made are only approximate, they are sufficiently accurate to give an idea of the enormous numbers present. At Rothamsted

Experiment Station it is calculated that there are over 65,000,000 bacteria in every gram of surface soil. Remembering that a gram of soil is only about a saltspoonful, or about one twenty-eighth of an ounce, the vastness of the number present can be appreciated. From this number it was estimated that the bacteria present would approximate 75lbs. weight per acre. There are very large numbers of other microscopic forms of life also present in all fertile soils, aggregating according to the Rothamsted calculations over 700lbs. weight per acre. Of the microscopic forms of life in the soil, bacteria are the smallest, being about 1/50,000in. to 1/20,000 inch in length, whilst the protozoa are about a thousand times larger, measuring about 1/2,500in. in length.

The nitrogen returned to the soil and that newly collected and stored there, is in several different forms, but as far as we now know the only way plants can absorb nitrogen is when it is combined as nitrates, and when these nitrates are dissolved in the soil moisture. The conversion of the various forms of nitrogenous compounds into nitrates is known as *nitrification* and is carried out by bacteria present in the soil. Nitrification is brought about by three distinct kinds of bacteria, and in successive steps. Organic nitrogen is converted to ammonia by one form of bacteria. This is of common occurrence where a mass of organic matter is thrown together to decompose, and the liberation of ammonia is particularly noticeable in the neighborhood of heaps of farmyard manure, because it is given off in such large quantities that its pungent odor can be recognised at some distance from its source. The same kind of bacteria that converts the nitrogenous compounds in the heap of decaying organic matter into ammonia, is doing similar work in the soil, and as soon as the ammonia is formed it combines with other soil constituents to form *ammonium compounds*. The ammonium compounds are attacked by another form of bacteria, which free the nitrogen from its combinations, and liberate it as *nitrous acid*, which combines with various soil constituents to form *nitrites*. The nitrites in their turn are acted upon by still another form of bacteria, and *nitric acid* is set free to combine with soil constituents as *nitrates*, which is the form in which plants are able to absorb the nitrogen.

MINERAL MATTERS.

The mineral matters essential to plant growth are all secured from the soil, and, as far as is now known, the only way that these can enter the plant is through the roots when the minerals are in solution in the soil moisture. The roots of plants are constantly absorbing moisture from the soil, which passes up the tissues of the plants, and most of it is evaporated from the leaves, and as far as we now know, this soil moisture, and perhaps some gases, are the only substances taken up by plant roots. This being so it is necessary for the mineral matters to be soluble in the soil moisture before they can be absorbed by plants.

MANURING.

The term *manuring* has already been described as " *the making good any shortage of a mineral plant food.*" Fortunately this definition can be narrowed down still further because analyses of soil and field results have shown very clearly that with relatively few exceptions, all soils are amply supplied with most of the mineral matters essential to crops to last for hundreds, and perhaps for thousands of years. The only essential mineral matters of which there is likely to be a shortage in most soils of the world are nitrogen, potash, phosphoric acid, and in a few cases lime, so that for all practical purposes the definition of manuring can be simplified to " making good a deficiency in the soil of nitrogen, potash, phosphoric acid or lime." In some places soils are well supplied with all mineral plant foods except one essential element, as is the case in South Australia where many soils are really fertile except for a very great shortage of phosphorus. In other localities there may be a deficiency of nitrogen as well as phosphorus, and in a few places soils may be used for crop growing, although the four principal mineral plant foods may be so deficient that full crops cannot be grown without making up the shortage by applications of manures.

That the continued removal of crops from the land will eventually lead to a considerable reduction in the quantity of the main mineral plant foods present in any soil, can be realised from the figures in the next table, where the amounts of the principal minerals taken from the soil by some of the well-known crops are set out:—

TABLE V.—*Principal Mineral Plant Foods Removed by Crops.*

Crop.	Weight per Acre.	Removed per Acre.			
		Nitrogen. (N).	Phosphoric Acid (P_2O_5).	Potash (K_2O).	Lime (CaO).
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
*Wheat—					
Grain	1,500	28·3	12·4	8·2	0·9
Straw	2,500	13·6	5·8	16·6	7·0
Total	4,000	41·9	18·2	24·8	7·9
*Oats—					
Grain	1,600	30·2	11·4	8·0	1·6
Straw	2,100	13·4	6·3	39·4	9·5
Total	3,700	43·6	17·7	47·4	11·1
†Barley—					
Grain	2,000	39·7	16·3	10·0	1·2
Straw	1,600	7·8	3·1	16·9	5·0
Total	3,600	47·5	19·4	26·9	6·2
†Rye—					
Grain	1,120	19·0	9·9	6·7	0·5
Straw	2,000	9·6	5·4	18·7	6·8
Total	3,120	28·6	15·3	25·4	7·3
†Peas—					
Grain	1,800	—	18·0	22·0	4·0
Straw	2,200	—	4·4	23·9	44·6
Total	4,000	—	22·4	45·9	48·6
*Maize—					
Seed	2,800	46·1	16·4	10·8	0·8
Cobs	700	2·7	0·04	0·4	0·02
Stalks	2,300	14·0	8·7	3·8	11·5
Total	5,800	62·8	25·14	15·0	12·32
*Flax—					
Seed	900	39·0	15·0	8·0	3·0
Straw	1,800	15·0	3·0	19·0	13·0
Total	2,700	54·0	18·0	27·0	16·0
*Potatoes—					
Tubers	14,000	47·0	18·9	67·2	3·0
Haulms	4,500	21·1	6·8	18·8	28·1
Total	18,500	68·1	25·7	86·0	31·1

TABLE V.—*Principal Mineral Plant Foods Removed by Crops*—continued.

Crop.	Weight per Acre.	Removed per Acre.			
		Nitrogen. (N).	Phosphoric Acid. (P_2O_5).	Potash (K_2O).	Lime (CaO).
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
*Sugar Beet—					
Roots	20,000	57·6	12·6	55·0	6·3
Tops	10,000	38·0	11·7	64·5	49·6
Total	30,000	95·6	24·3	119·5	55·9
*Mangels—					
Roots	50,000	112·0	29·4	180·1	12·9
Tops	18,500	51·8	16·7	79·1	27·5
Total	68,500	163·8	46·1	259·2	40·4
*Turnips—					
Roots	40,000	70·4	38·7	138·2	32·3
Tops	11,600	49·8	13·2	42·4	59·5
Total	51,600	120·2	51·9	180·6	91·8
†Swedes—					
Roots	32,000	61·4	18·4	69·0	21·5
Tops	4,800	28·6	4·9	16·7	23·1
Total	36,800	90·0	23·3	85·7	44·6
‡Beans—					
Grain	1,920	77·0	22·8	24·3	2·9
Straw	2,240	29·0	6·3	42·8	26·3
Total	4,160	106·0	29·1	67·1	29·2
§Lucerne Hay	8,960	176·0	44·9	133·8	253·4
‡Tare Hay	2,800	62·0	12·8	36·4	47·0
§Sainfoin Hay	3,920	71·3	18·7	70·9	57·8
‡Red Clover Hay	4,480	102·0	24·9	83·4	90·1
‡Meadow Hay	3,360	49·0	12·3	50·9	32·1
*Timothy Hay	3,000	28·3	21·0	64·6	14·3
*Cabbages	40,000	153·6	48·6	199·2	95·3
§Kale	44,800	100·3	84·5	171·6	101·2
*Onions	28,500	63·0	32·4	63·5	42·7
*Tobacco Leaf	1,500	58·8	10·8	67·3	83·4

* "Soil Fertility and Fertilisers," by J. E. Halligan.

† Calculated from J. E. Halligan's tables.

‡ McConnell's Agricultural Notebook.

§ Muntz and Girard.

INFLUENCE OF THE VARIOUS FERTILISERS.

Where intense culture is being practised, as in market gardens, " home " gardens, and " mixed " farming, it is usually found to be necessary to apply manures containing all of the four fertilising elements—nitrogen, phosphoric acid, potash, and lime, otherwise good results cannot be secured with certainty over a long period of years. The proportion of the several fertilising substances in a mixed manure should vary with the crop, the season, the fertility of the land, &c., and because of this, as well as the more important reason that these fertilising elements all play a different part in plant metabolism, some knowledge of the influences of each one of the fertilising elements, particularly as it applies to commercial fertilisers, is essential for all those using manures for cropping.

NITROGEN.

Nitrogen is the plant food which encourages luxuriant growth in plants, and as such it must be present in adequate quantities for plants from which much leaf development is expected. A shortage of nitrogen in the soil is usually evidenced by poor, stunted growth, scanty foliage, and a general sickly yellow appearance. When there is an excess of nitrogen present plants become over-luxuriant and rank, their susceptibility to disease is greatly increased, and their tendency to produce seeds is reduced. Nitrogen promotes a strong growth of foliage of a deep green color, but does nothing towards increasing the general hardiness of plants, and lowers their powers of resistance to droughty conditions.

Nitrogen must be in combination as one of the nitrates before plants can absorb it, and the necessary changes are brought about by soil bacteria. When fully encouraged, the soil bacteria quickly convert most salts of nitrogen brought to the soil, into nitrates, but it is a relatively slow process to change the nitrogen in organic matter so that it becomes available to plants. By providing a full supply of organic matter to the soil, and encouraging the activities of the soil bacteria, applications of nitrogenous manures can generally be dispensed with.

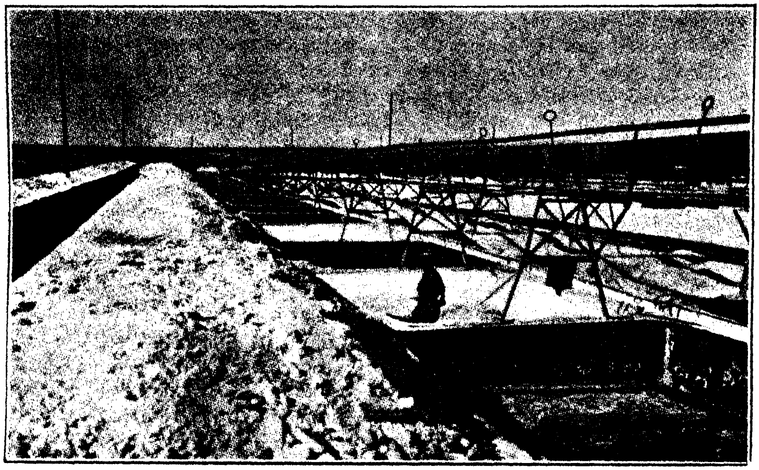
The nitrogenous fertilisers available to crop growers can be separated into—(1) *Nitrate nitrogen*, which is found in nitrate of soda and nitrate of lime ; (2) *Ammonia nitrogen*, which is found in sulphate of ammonia, chloride or muriate of ammonia, ammonium phosphate and urea ; (3) *Cyanamid nitrogen*, which is collected from the air by electrical means and combined up with calcium, carbon, etc ; and (4) *organic nitrogen*, which is found in vegetable and animal substances.

NITRATE OF SODA.

Nitrate of soda is a whitish, yellowish, or pinkish crystalline salt, which is found in extensive deposits in Chile in South America. The deposit of nitrate of soda is known as Caliche, and varies in purity from samples containing just a little nitrate of soda to others with up to 60 per cent. The caliche is found in layers sometimes 6ft. thick, with an overlie of from 2ft. to 10ft., and is blasted out with some earthy matter adhering to it. It is dissolved in hot water, and the solution is run in pipes to crystallising pans where the crystals of nitrate of soda separate out on cooling. Any liquid left is returned to the dissolving vats and is used over again.

Nitrate of soda contains 15 to 16 per cent. of nitrogen. It is so very soluble in water that the ideal way to apply it is in small quantities frequently, and this is particularly so where heavy rainfall is received or where irrigation water is applied. The old form of nitrate of soda tended to attract moisture to itself, and then became rather sticky and damp and it had to be stored so that it would keep dry, but the new form of commercial product, which is in a granular state, is not nearly so bad in this respect. It should be kept away from livestock because it might poison them.

Nitrate of soda is ready for use by plants as soon as it is applied, and so it is recognised as a very quick-acting form of nitrogenous fertiliser, and as such is suitable for use in cold, wet soils where the nitrogen-collecting and nitrogen-fixing bacteria are not very active. In heavy soils nitrate of soda has a bad effect on their mechanical condition, by deflocculating the soil particles, thus rendering them very sticky and difficult to cultivate. This disadvantage can be overcome by using a mixture of nitrate of soda and sulphate of ammonia, about half and half, and it is not very noticeable where heavy dressings of superphosphate are applied as well as the nitrate of soda. Because nitrate of soda is so soluble and readily leached out of the soil, it should be applied as a topdressing to crops after they have germinated, in all places where the rainfall is at all high. In semi-arid climates, where the everage annual rainfall is not more than 20in., when an application of nitrate of soda is warranted (which is very seldom) it can be applied at seeding time, with just as good results as waiting until after crops have germinated or applying the dressings in the early spring.



[From "Nitrate of Soda," by Alfred E. Stephen.

CRYSTALLISING TANKS AND DRAINING BENCHES FOR COLLECTION OF NITRATE OF SODA.

Nitrate of soda is extracted from caliche by treatment with a succession of hot water solutions, and the crystallisation of the fertiliser when the solutions are allowed to cool. The illustration shows the crystals of nitrate of soda being removed from the crystallising tanks and placed upon sloping draining benches.

Owing to the rapidity of its action on plants, nitrate of soda can be advantageously applied to crops that have been checked in their early stages of growth, and it will almost invariably lead to their recovery, and enable them to reach full maturity.

Applied to heavy-textured lands, it liberates potash for the use of plants.

NITRATE OF LIME.

Nitrate of lime is quite equal to nitrate of soda as a fertiliser, provided that the same amount of nitrogen is applied, and it has the advantage over nitrate of soda, that it does not deleteriously affect the mechanical condition of the land.

Nitrate of lime is one of the synthetic nitrogenous compounds, wherein the nitrogen is collected from the air and combined with something to form a compound which remains stable. It is produced by what is known as the Arc process, and until recently was only manufactured in Norway where water-power is abundant, but during the last few years it is being made in Germany, and because of a higher content of nitrogen, the German product is selling more freely than the Norwegian. The nitrate of lime produced in Norway contains 13 per cent. of nitrogen, whilst the German article has 15·5 per cent. of nitrogen.

In the Norwegian system of manufacture, which is known as the Berkeland-Eyde Process, the nitrogen is combined with oxygen at a temperature of 2,600 degrees C. to 3,000 degrees C., with the aid of an electric arc flame. The nitric oxide is cooled, dissolved in water, and repeatedly concentrated until the liquid contains 50 per cent. of nitric acid. In the last concentrating tower (the fifth), the absorbing mixture is milk of lime, and the resulting mixture of calcium nitrite and calcium nitrate is treated with enough of the previously formed nitric acid to fully convert it into nitrate. The product is then concentrated until it solidifies as a material of about 75 per cent. of pure calcium nitrate, and containing about 13 per cent. of nitrogen.

In most tests with nitrate of lime it gives identical results with those secured when nitrate of soda has been used, but this fertiliser is liable to become moist and sticky in damp weather, and so it is sold in barrels or specially waterproofed sacks.

SULPHATE OF AMMONIA.

Sulphate of ammonia is a by-product (*a*) in the manufacture of gas by the distillation of coal, (*b*) from the manufacture of bone-black, and (*c*) from the manufacture of coke from coal. Coal contains on the average close on 2 per cent. of nitrogen, and bones contain from 3 per cent. to 4½ per cent. When heated some of the nitrogen is driven off as ammonia, which is collected in water, and is then distilled into sulphuric acid, concentrated, and the crystals of sulphate of ammonia separate out on standing.

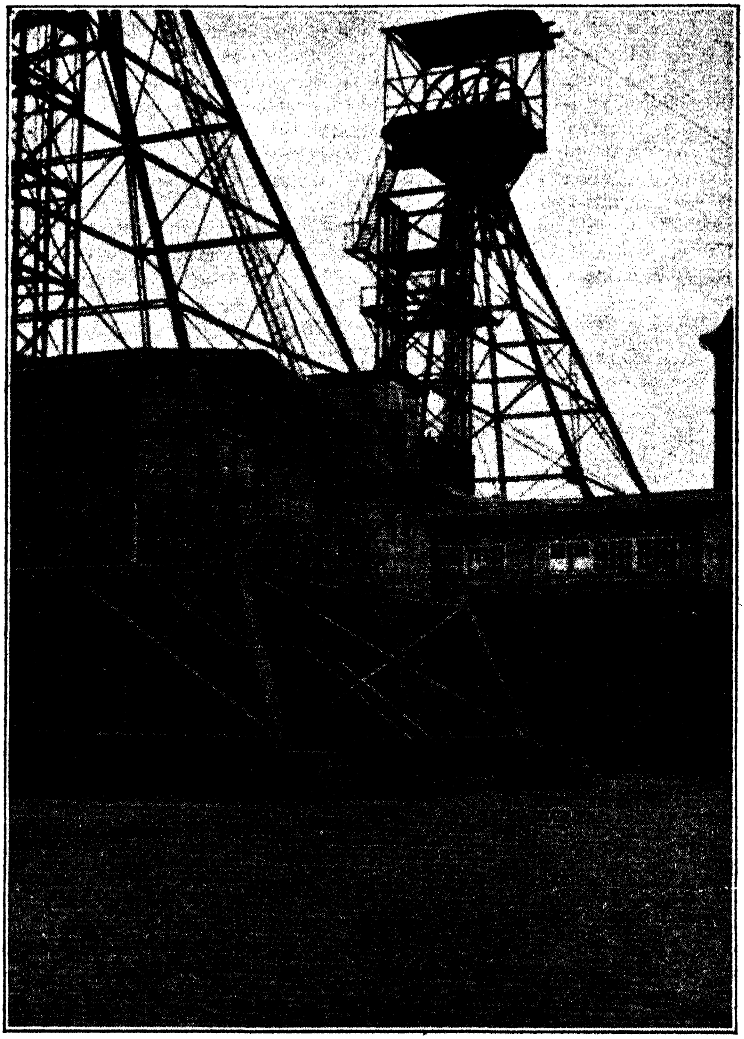
In recent years sulphate of ammonia has also been made synthetically, and so rapid has been the increase in manufacture of this form of nitrogenous fertiliser that at the present time in Great Britain the quantity produced far exceeds that of by-product sulphate of ammonia. The enormous expansion of the sulphate of ammonia industry has made it impossible for some coal-gas producers to compete with the new synthetic methods. The Gas Companies in Great Britain are not allowed to leave ammonia in the gas, nor to run it away in drains, so they must remove it and dispose of it in some way. As a liquid manure it has proved useful, but is bulky and inconvenient to distribute, and numerous experiments are now being carried out to discover a method of economically converting it into a solid form.

Commercial sulphate of ammonia consists of greyish, yellowish, or bluish colored crystals of small size, containing about 20 per cent. of nitrogen, and is in a form very suitable for distribution in the soil. Although it has to be converted into nitrates, the change is brought about so quickly that it is a rapid-acting fertiliser, although not quite so much so as are the nitrate fertilisers. It is readily soluble in water, but does not pass out of the soil in the drainage quite so soon as do the nitrates. It has no injurious effect on the mechanical condition of the soil, except that it tends to reduce the lime content. Naturally, if heavy dressings of sulphate of ammonia are continuously used on soils not too well supplied with lime, the reduction of the already low lime content will tend to ruin the texture of the land and lead to increased acidity.

In Australia sulphate of ammonia is the cheapest nitrogenous fertiliser on the market, and as it is rapidly converted into nitrates in our climatic conditions, it is the most important of all the manures containing nitrogen.

MURIATE OF AMMONIA.

Muriate of ammonia, which is sometimes known as sal-ammoniac, has been used commercially for a very long time, but it is only of recent years that it has been produced as a manure. The interest shown in this material has not been very great until the last eight or 10 years, because the muriate was considered to be injurious to plants in some way, but now that manufacturing methods have been much



OVERHEAD GEARING AT A STASSFURT POTASH MINE.

The mines from which the potassic manures are obtained in Stassfurt are so deep that extensive overhead gearing is necessary at the head of each shaft.

improved more notice is being taken of it, and a good deal of experimental work is being carried out, comparing it to the well-known forms of nitrogenous fertilisers. Because of its high nitrogen content (31·78 per cent. when pure), the probabilities are that this fertiliser will be heard of in the near future.

In experiments conducted at Rothamsted Experimental Station the muriate of ammonia proved less effective than sulphate of ammonia for potatoes, but more effective for barley. Barley grown with nitrogen added as muriate of ammonia was always of better quality than that grown with sulphate of ammonia, and consistently sold at a higher price. The analyses of the grain showed that it contained less nitrogen when the muriate was used.

UREA.

The principal nitrogenous ingredient of urine is urea. Under the action of ferments urea combines with water to form ammonium carbonate. Urea can now be manufactured synthetically, and is one of the most concentrated of the new fertilisers, containing 46 per cent. of nitrogen. It is made from calcium cyanamide or direct from ammonia and carbonic acid.

Although urea has not been known as a fertiliser for very long, except when present in farmyard manure, it seems certain that when it can be manufactured cheaply it will prove a highly valuable nitrogenous fertiliser.

CYANAMIDE.

Cyanamide of lime ($CaCN_2$) or nitrolim is made by fusing lime and coke together in an electric furnace and then passing atmospheric nitrogen over the heated carbide. The compound called cyanamide is formed, and when this is ground to a powder and applied to the soil it gives up its nitrogen as ammonia.

The production of cyanamide has been carried on for some years, and it continues to increase. Until recently it contained 19 per cent. of nitrogen, but in 1928 it was raised to 20·6 per cent.

Cyanamide gives about the same results as nitrate of soda and sulphate of ammonia, so it is a useful substitute for either of these nitrogenous manures, although it is not so suitable for application to growing crops. It is now supplied in granular form easy of application.

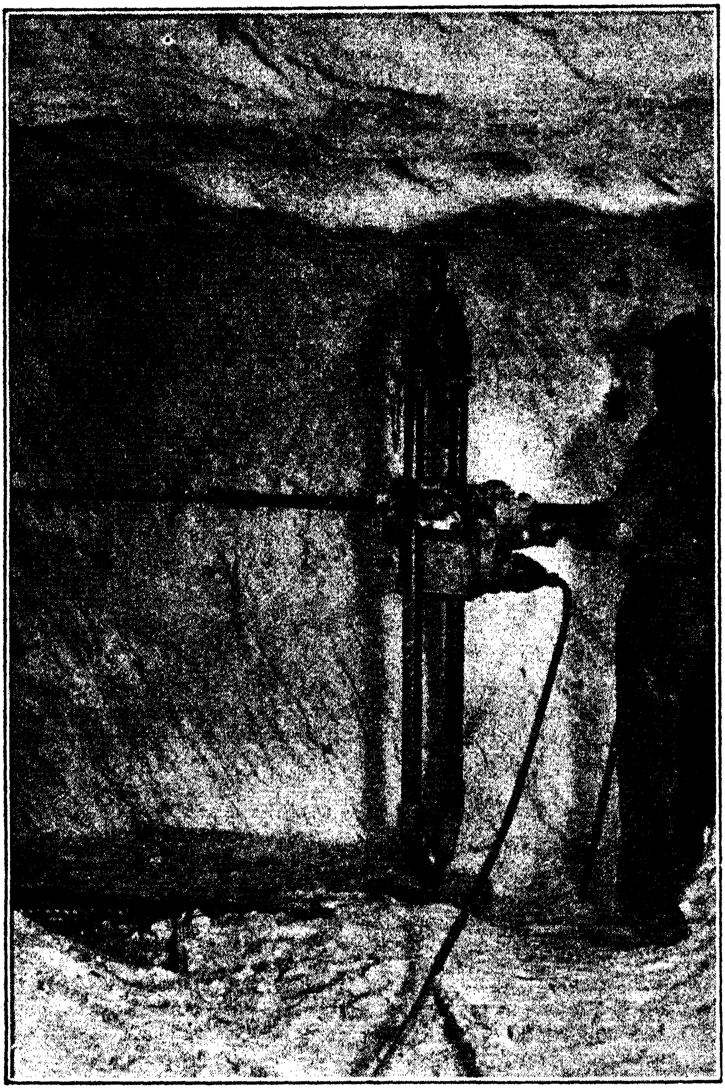
NEW NITROGENOUS FERTILISERS.

Much of the nitrogen now fixed in fertilisers by the large industrial organisations is converted into new compounds not hitherto supplied to farmers. Of these manures, four of them contain only ammonia and phosphates and are in a crystalline form, whilst there are six " complete " fertilisers in granular form. All are in a very good condition for sowing.

In the fertilisers produced by Imperial Chemical Industries, Ltd., in England the phosphate is present as ammonium phosphate, the ammonia as ammonium phosphate and ammonium sulphate, and the potash as sulphate or muriate of potash.

These compound fertilisers are very little dearer than the ordinary manures necessary to make up a mixture of equal agricultural value, and the difference in price is less than the 10 per cent. usually allowed for mixing.

These new fertilisers are so concentrated that two tons of the usual fertilisers would, on the average, be needed to supply as much plant food as is contained n one ton of the new compounds.



BORING FOR POTASH DEPOSITS PREPARATORY TO BLASTING.
In the Stassfurt Potash Mines, when preparing for blasting the consolidated mass of salts, up-to-date electrically-driven drills are used to make the holes to receive the charges of explosives.

The next table gives analytical and other datà which show the constituents of manures now being manufactured by Imperial Chemical Industries, Ltd. :—

TABLE VI.—*Analyses of Concentrated Fertilisers Based on Ammonium Phosphate.**

Nitrogen (N).	Analysis of Fertiliser. Phosphoric Acid (P_2O_5). Water Soluble.	Insoluble.	Potash (K_2O).	Ratio N : P_2O_5 : K_2O.	Weight of Mixed Fertilisers to Contain same Amount of Ingredients as 1 ton of Compound Fertiliser.
%	%	%	%		Tons.
12·5	12.5	—	15·0	1 : 1 : 1¼	1·70
10·4	10·4	—	20·8	1 : 1 : 2	1·57
10·4	20·8	—	10·4	1 : 2 : 1	2·01
8·0	16·0	5·5	16·0	1 : 2¾ : 2	1·93
7·5	26·0	6·0	7·5	1 : 4¼ : 1	2·37
6·5	22·5	3·0	13·0	1 : 4 : 2	2·11
14·3	43·0	—	—	1 : 3 : —	3·38
18·0	18·0	—	—	1 : 1 : —	2·00
16·0	32·0	—	—	1 : 2 : —	2·78
12·3	56·5	—	—	1 : 4½ : —	4·13

* Sir E. J. Russell, in "Agricultural Research in 1930."

These new fertilisers contain no calcium sulphate, which forms a large part of superphosphate, and has distinct fertiliser value, and it is not yet known whether this will prove a serious disadvantage or not. Like all other mixed manures they will usually supply some manurial elements not required by the crop to which they are applied, and so will often prove unnecessarily expensive. Such small applications will be necessary because of their concentration, that regular distribution is likely to prove very difficult with present-day machinery.

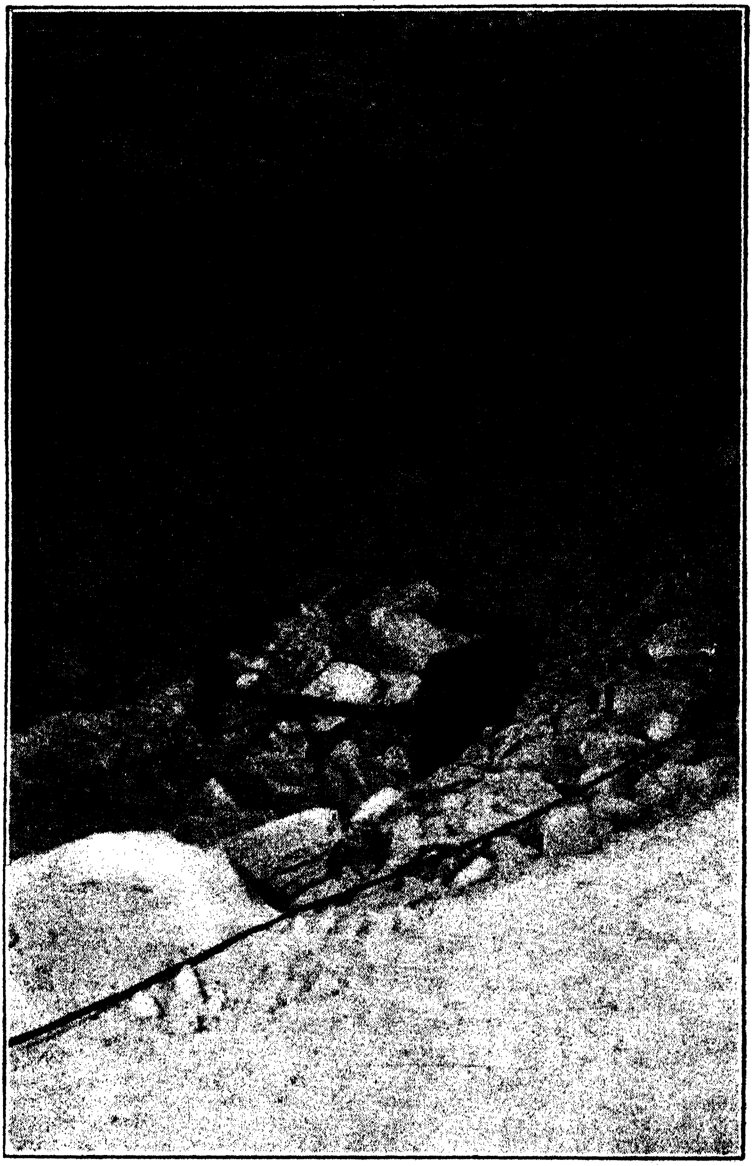
WORLD PRODUCTION OF NITROGENOUS FERTILISERS.

The production of nitrogenous fertilisers has gone ahead by leaps and bounds in recent times, and the figures in the next table show that in the past 30 years the quantity produced in the world has increased about six-fold :—

TABLE VII.—*World Production and Consumption of Nitrogen.**

	Pure Nitrogen. 1903.	1912.	1924-25.	1926-27.	1927-28.	1928-29.
	Tons.	Tons.	Tons.	Metric Tons.	Metric Tons.	Metric Tons.
Sulphate of Ammonia—						
By-products	108,000	247,000	290,000	303,200	368,000	376,000
Synthetic	Nil	Nil	255,000	300,000	367,000	485,000
	108,000	247,000	545,000	603,200	735,000	861,000
Cyanamide	Nil	19,000	115,000	180,000	204,000	210,000
Nitrate of Lime	Nil	10,000	25,000	81,000	105,000	136,000
Other Synthetic Forms	Nil	Nil	60,000	133,400	236,000	365,000
Other By-product Forms				40,300	54,000	51,000
Chilean Nitrate of Soda	221,000	401,000	363,000	199,600	390,000	490,000
Total	329,000	677,000	1,108,000	1,237,500	1,724,000	2,113,000
Agricultural Consumption (about)	—	—	—	1,200,000	1,490,000	1,684,000

* Sir E. J. Russell, in "Agricultural Research in 1925;" "Agricultural Research in 1928"; "Agricultural Research in 1929."



POWER-DRIVEN DRAG SCOOPS USED IN THE STASSFURT MINES.

After blasting out the crude potash salts, scoops drawn by cables are often used to bring the loosened mass to central points, where it is loaded on to the trucks, which eventually carry it right to the surface.

POTASH.

In plant nutrition potash appears to have the special function of promoting the formation of the carbo-hydrates and fibre, *i.e.*, sugars, starch, oils, cellulose, etc., and in promoting the growth of leguminous plants. Because of its power of increasing the carbohydrates of plants, manures containing potash are very important for intense culture, for they benefit all of the starchy " root " plants such as potatoes, artichokes, dahlias, gladioli, anemones, sweet potatoes, &c.; all the fruits and especially the sweet ones; and all of the nuts are particularly benefitted. Potash also encourages extra vigor in plants, strengthens their stems, and tends to make them more resistant to diseases.

Light sandy soils and many peats contain but little potash, and in those countries where potassic fertilisers are beneficial these soils must receive dressings, otherwise heavy crops cannot be grown on them. Heavy-textured lands, on the other hand, are usually rich in potash Clay is derived from rocks rich in potash, and as all heavy-textured soils contain a considerable proportion of clay, applications of potash rarely benefit crops on such soils.

When plants are suffering from a shortage of potash they develop a lot of red coloring along stems and leaves which should normally be green, and the points of the leaves tend to die back. These evidences of lack of potash are very rarely seen in South Australia, but are occasionally noticed, during winters of plentiful rains and much cloudy weather, in some of the poor whitish sand to be found along the Adelaide to Melbourne railway line. As soon as the Spring arrives with rising temperatures and clear sunny days, the plants recover and take on their normal coloring.

When potash is required but is difficult to obtain, applications of salt, lime, gypsum, and nitrate of soda liberate this substance from its non-available combinations in the soil.

Potassic fertilisers have a bad effect on the texture of soils by the deflocculation of the soil particles, due to the formation of potassium carbonate.

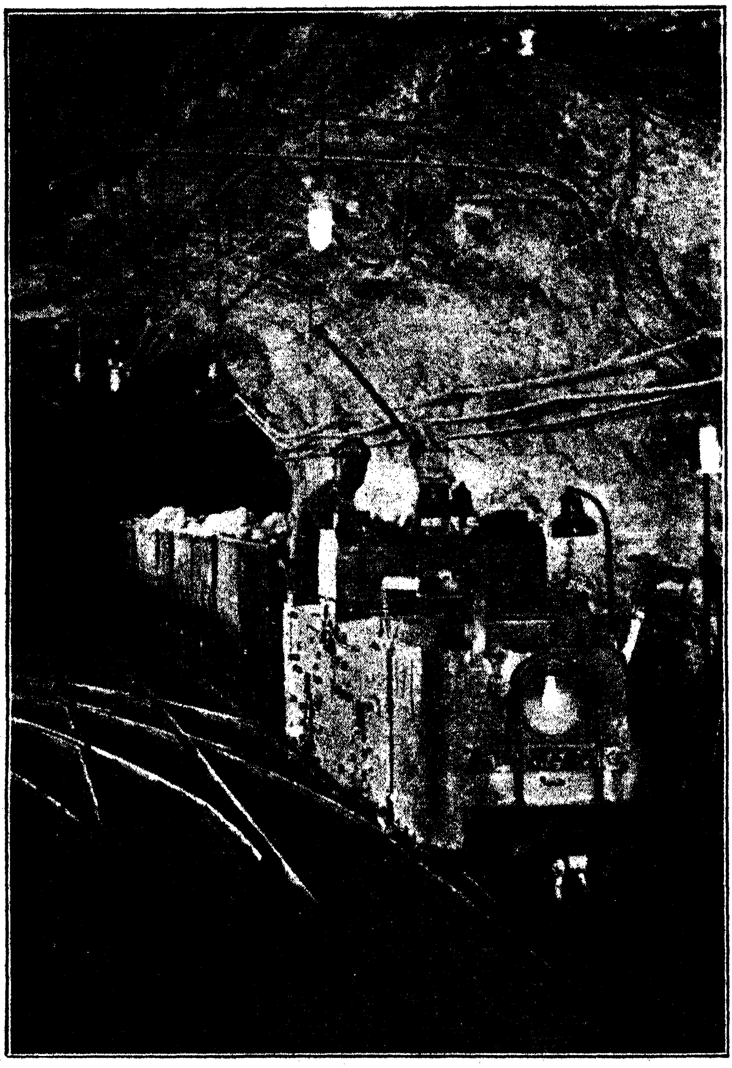
All potassic manures delay the germination of seeds and retard the early growth of plants, so they should be applied to the soil some little time before the seed is sown.

In South Australia the use of potassic fertilisers does not appear to be an economic proposition anywhere, unless it be in those few places where market gardening and flower growing are practised on poor sandy soils. Even in those localities where anlayses show the soils to be extremely deficient in potash, additions of potassic manures rarely give any increased crop, and in nearly all cases have a depressing effect on yields. Most soils in this country are very well supplied with potash, and even those not too well provided with this substance readily give up sufficient to plants to enable them to produce full crops.

Sources of Potassic Manures.

Until 1861, when potash salts taken from mines were sold as manures, no extensive use could be made of potash as a fertiliser because about the only source up to that time was wood ashes, although there was a small supply of nitrate of potash or saltpetre from India, and a little " Kelp " or the ashes of seaweed, was available. From the above-mentioned date until a few years ago practically all of the potassic fertilisers used in the world were obtained from the Stassfurt deposits in Germany, but since the Great War mines have been exploited by the French in Alsace.

Borings made in the salt-manufacturing district of Stassfurt disclosed a huge deposit of rock salt at about 1,000ft. down, upon which rested a layer of minerals containing potassium and magnesium salts. When the mines were first opened up for the recovery of the rock salt, the potassic salts were removed as useless, but it was not long before they proved to be the most valuable materials in the



BRINGING POTASH SALTS TO THE CAGES IN A STASSFURT MINE.

Up-to-date equipment of all kinds is provided in the efficiently controlled potash mines at Stassfurt, from which the bulk of the potassic fertilisers used in the world are obtained. The salts are brought some distance underground by these modern trains to the elevators, when batches of loaded trucks are lifted to the surface in cages.

mines. These deposits, which are very considerable, appear to be the result of the drying up of a sea or great salt lake. The sequence of deposits is what is to be expected by the evaporation of sea water, the various salts crystallising out at different stages in the concentration of the liquid, the least soluble anhydrite (anhydrous sulphate of lime) at the bottom, then the sodium chloride in bulk, while at the top are gathered together the magnesium and potassium salts which would be the last to remain in solution.

The sequence of deposits varies according to the site, but in a general way is—

1. 600ft. to 800ft. of red sandstone, limestone, &c.
2. A bed of gypsum.
3. Very pure "younger" rock salt.
4. A bed of anhydrite (anhydrous sulphate of lime).
5. A bed of tough impervious clay, which was a waterproof layer thus preventing the solution of the highly soluble salts below.
6. Potash and magnesium salts, of which the top layer is carnallite (a crude double chloride of potassium and magnesium) of a thickness of 50ft. to 130ft., and is the main source of the manufactured salts.
7. The "Kieserite" region, where this crude sulphate of magnesium predominates.
8. The "polyhalite" region, which is characterised by the prevalence of this complex sulphate of potash, lime, and magnesia.
9. The "older" rock salt, 2,000ft. or more in thickness, interspersed with and underlaid by layers of anhydrite.

The perpendicular distance from the lowest to the upper surface of the salt deposits is about 5,000ft.

In preparing the mined materials for use as fertilisers certain of the crude salts as found are mixed together and ground, or a mixture of salts is dissolved in water, and various grades of material are obtained by evaporation. The principal potash salts obtained from these mines which are used as fertilisers are :—Muriate of potash, sulphate of potash, kainit, and sylvinit.

MURIATE OF POTASH.

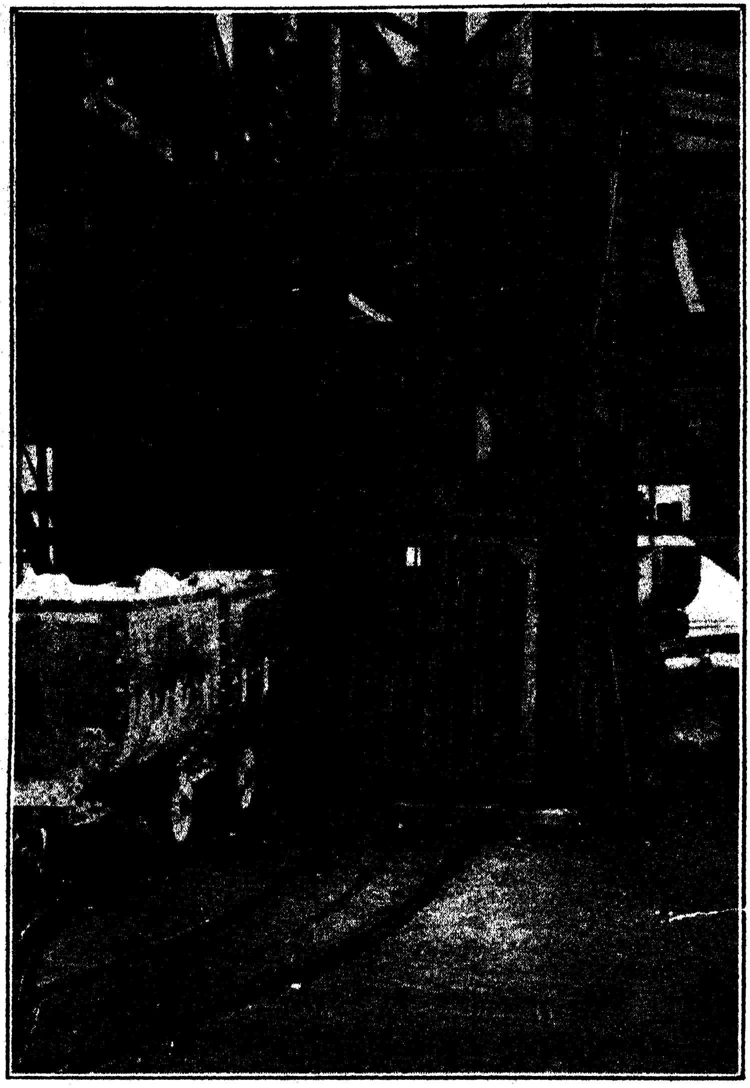
Muriate of potash is one of the principal forms of potassic fertiliser sold in this State, and originally came only from the Stassfurt mines in Germany, but is now being received from the French mines in Alsace as well. This fertiliser is the most concentrated form in which potash is applied, and is usually cheaper per unit than are the other forms. In appearance it looks like coarse, dirty colored, common salt of a yellowish color, and as such can be easily handled. It mixes well with the other ordinary forms of fertilisers. It has a tendency to deplete the lime content of the soil, so should only be used where plenty of lime is present.

Muriate of potash can be used for all crops requiring more potash, but the chlorine it contains is likely to lower the quality of crops such as tobacco, potatoes, onions, sugar beet, &c. If it is necessary to supply potash to soils already containing an excess of soluble salts, such as is the case in many of our low rainfall districts, some form other than muriate should be used, because the chloride brought with the fertiliser increases the injurious salts.

Ordinary commercial muriate of potash is about 80 per cent. pure, which is equivalent to a little over 50 per cent. of potash. The impurities consist mainly of sodium chloride, the lower the grade the more common salt present.

SULPHATE OF POTASH.

Sulphate of potash is more expensive than the muriate because the cost of manufacture is higher, but it can be used with safety for manuring all plants, including those where quality is of great importance, and also in soils lacking in



DELIVERING POTASH SALTS AT THE SURFACE.

The trucks which bring the loosened potash salts from central collecting points are brought to the surface in batches, in the fairly large cages which form part of the modern equipment of the Stassfurt Potash Mines.

lime. It is a dry, yellowish, crystalline substance, almost powdery in texture. The ordinary sulphate of potash offered for sale in this country is the high grade containing 50 per cent. potash.

KAINIT.

Kainit is a common product of the Stassfurt mines, and consists of a mixture of the original materials as taken from the mines, which receives no further preparation except grinding. A number of different salts are found in the mixture, but mainly sodium chloride and potassium sulphate and appreciable amounts of sulphate and chloride of magnesia. Kainit usually contains about 13 per cent. of potash. A full analysis shows about 34 per cent. sodium chloride, about 21 per cent. potassium sulphate, about 14 per cent. magnesium sulphate, about 12 per cent. magnesium chloride, small amounts of potassium chloride, calcium sulphate, and insoluble substances, and about 13 per cent. of water.

It takes about four times as much of this low-grade potassic manure—Kainit—as it does of muriate of potash to supply a given amount of potash. As it contains a lot of chlorides the same restrictions apply to its use as with muriate of potash. It should always be applied to the soil so that it does not come in contact with seeds because it injuriously affects the germination of them. Kainit is especially suitable for crops that originated near the sea, such as beets, asparagus, kale, rape, &c.

SYLVINIT.

Sylvinit is very similar to kainit, but it contains the bulk of its potash in the form of chloride rather than as sulphate. It is mined in Alsace, and when ground is of a reddish-grey color. Sylvinit contains about 17 per cent. of potash, and an analysis shows the fertiliser to consist of about 57 per cent. of sodium chloride and about 26 per cent. of potassium chloride, which is the bulk of the material.

(To be continued.)

METROPOLITAN ABATTOIRS, ADELAIDE

MANUFACTURERS OF

Meat Meal for Pigs

Read Report of Trials made by PROF. PERKINS,
Journal of Agriculture, January and July, 1921.

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The GENERAL MANAGER, Metropolitan Abattoirs Board,
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ALSO MANUFACTURED—

Blood Manure Bone Manure

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breed—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1.—WHITE LEGHORNS.

Competitor.	Address.	Score to Month ending January 31st, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
S. Austwick	West Marden	(1) 182	(2) 188	(3) 134	504
C. R. Barker	Edwardstown	(4) 69	(5) 143	(6) *	212
H. Bolland	Knoxville	(7) *	(8) 172	(9) 138	310
A. Butson	Clarence Park	(10) 177	(11) 122	(12) 175	474
A. B. Carmichael	Woodville West	(13) dead	(14) *	(15) *	—
Carroll & Leedham	Forest Gardens	(16) 99	(17) 174	(18) 183	456
W. A. Carter	Glandore	(19) 154	(20) 169	(21) 127	450
W. L. Cleland	Beaumont	(22) 164	(23) 147	(24) dead	311
B. Cooke	Kanmantoo	(25) 97	(26) 156	(27) 201	454
Syd. Cooper	Edwardstown	(28) 146	(29) 130	(30) 157	433
L. H. Crawford	Grange	(31) dead	(32) 129	(33) 160	289
R. C. Crittenden	Kilkenny North	(34) 164	(35) 211	(36) 215	590
A. G. Dawes	Glenunga Gardens	(37) 205	(38) 162	(39) 174	541
A. G. Dawes	Glenunga Gardens	(40) 129	(41) dead	(42) †	129
A. G. Dawes	Glenunga Gardens	(43) 178	(44) 143	(45) *	321
A. G. Dawes	Glenunga Gardens	(46) 173	(47) 163	(48) 123	459
A. G. Dawes	Glenunga Gardens	(49) 127	(50) 148	(51) 174	449
A. G. Dawes	Glenunga Gardens	(52) 148	(53) 223	(54) 149	520
A. G. Dawes	Glenunga Gardens	(55) 185	(56) dead	(57) 166	351
T. Duhring	Mallala	(58) 133	(59) 152	(60) 169	454
Colin J. Easther	Black Forest	(61) 185	(62) 149	(63) 196	530
J. L. Edgcumbe	Plenty, Victoria	(64) 191	(65) 184	(66) *	375
H. Fidge	Clarence Park	(67) 117	(68) 170	(69 *	287
Russell H. Fox	Edwardstown	(70) 144	(71) 119	(72) 192	455
L. H. Gilbert	Glanville Blocks	(73) 98	(74) *	(75) 161	259
Keith Goldsmith	Kensington	(76) 196	(77) *	(78) *	196
A. G. Gore	Summertown	(79) 202	(80) *	(81) 177	379
A. & H. Gurr	Scott's Creek	(82) 126	(83) 184	(84) *	310
H. H. Hefford	Murray Bridge	(85) *	(86) *	(87) 174	174
H. H. Hefford	Murray Bridge	(88) 192	(89) 145	(90) *	337
Jas. Hillyer	Kilkenny	(91) 165	(92) 180	(93) 188	533
W. H. A. Hodgson	Salisbury	(94) 111	(95) 125	(96) 127	363
E. A. Lamerton	Edwardstown	(97) 127	(98) 103	(99) *	230
E. F. Lindquist	Semaphore Park	(100) *	(101) 187	(102) 181	368
Mrs. P. G. Lindsay	Croydon	(103) 133	(104) 130	(105) †	263
H. Morris	Seaton Park	(106) 160	(107) †	(108) 128	288
K. R. McPherson	Blackwood	(109) †	(110) †	(111) 94	94
H. R. Nicholls	Eden Hills	(112) *	(113) *	(114) †	—
J. H. Oliver	Goodwood Park	(115) 157	(116) *	(117) *	157
T. B. Radbone	Colonel Light Gdns.	(118) 159	(119) 139	(120) 152	450
H. A. Rassmussen	Ethelton	(121) 175	(122) 129	(123) *	304
Woodbury Poultry Farm	Crafers	(124) *	(125) 50	(126) 156	206
Woodbury Poultry Farm	Crafers	(127) 157	(128) 193	(129) 179	529
Bruce Rowe	Two Wells	(130) 200	(131) *	(132) 163	363

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitor.	Address.	Score to Month ending January 31st, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 134	(134) †	(135) 192	326
W. C. Slape	Magill	(136) 206	(137) 147	(138) 197	550
Thomas & Elson	Hawthorn	(139) 171	(140) 134	(141) 150	455
Thomas & Elson	Hawthorn	(142) 185	(143) 179	(144) 182	546
C. C. Vowels	Westbourne Park	(145) 167	(146) 180	(147) *	347
F. F. Welford	Colonel Light Gdns.	(148) 108	(149) 136	(150) 169	413
A. P. Urlwin	Balaklava	(151) 140	(152) 158	(153) 149	447
W. Wiese	Cabra	(154) dead	(155) 129	(156) *	129
W. Wiese	Cabra	(157) *	(158) *	(159) *	—
F. J. Williams	Millswood Estate	(160) *	(161) 160	(162) *	160
W. R. Williams	Frewville	(163) 148	(164) 153	(165) dead	301
W. R. Williams	Frewville	(166) 197	(167) 104	(168) 176	477
W. Woodley	Tailem Bend	(169) 148	(170) 167	(171) 144	459
D. C. Connor	Gawler	(172) †	(173) 182	(174) 169	351
A. E. Tolhurst	Torrens Park	(175) 134	(176) *	(177) 138	272
A. & H. Gurr	Scott's Creek	(202) *	(203) *	(204) 182	182
Totals		7,263	6,748	6,561	20,572

SECTION 2—ANY OTHER LIGHT BREED.

Black Minorcas.

V. F. Gameau	Woodville	(178) 116	(179) 127	(180) 133	376
Totals		116	127	133	376

Anconas

W. R. Williams	Frewville	(181) 125	(182) 129	(183) *	254
Totals		125	129	*	254

SECTION 3—BLACK ORPINGTONS.

N. F. Richardson	Woodville	(184) 92	(185) 217	(186) 183	492
Arthur Cook	Colonel Light Gdns.	(187) 198	(188) *	(189) †	198
B. Cooke	Kanmantoo	(190) *	(191) *	(192) 130	130
Jack Crago	Prospect	(193) 134	(194) 123	(195) †	257
L. H. Crawford	Grange	(196) 186	(197) 139	(198) 129	454
J. H. Dowling	Glossop	(199) *	(200) *	(201) *	—
F. J. Hudson	Prospect	(205) 186	(206) 152	(207) *	338
H. J. Mills	Edwardstown	(208) 151	(209) 201	(210) 225	577
H. J. Mills	Edwardstown	(211) 128	(212) 243	(213) *	371
J. Rawe	Seaton Park	(214) 208	(215) *	(216) *	208
B. O. Schubert	Tanunda	(217) 120	(218) *	(219) 110	230
G. Frisby Smith	Fulham	(220) 151	(221) 163	(222) 198	512
H. L. Twartz	Gawler	(223) 174	(224) 174	(225) 192	540
W. R. Williams	Frewville	(226) 199	(227) †	(228) 89	288
W. R. Williams	Frewville	(229) 163	(230) 190	(231) *	353
W. Woodley	Tailem Bend	(232) *	(233) 213	(234) 217	430
Totals		2,090	1,815	1,473	5,378

SECTION 4—ANY OTHER HEAVY BREED.

Rhode Island Reds.

H. Fidge	Clarence Park	(235) 163	(236) 155	(237) 138	456
V. F. Gameau	Woodville	(238) 192	(239) 143	(240) dead	335
W. R. Williams	Frewville	(241) 158	(242) 80	(243) 150	388
		513	378	288	1,179

* Denotes disqualified under Rule 13. † Denotes did not lay during July.

PURE BRED COWS COMPLETING OFFICIAL TEST

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved
			JUNIOR TWO-YEAR-OLDS—	
Not allotted	Anama Pontiac Queen	W. Hawker, Clare	Friesian	6/10/31
"	Riverdale Inka Pauline	Glen Leggoe & Co., Binnum	"	16/12/31
"	Melvin Anemone	A. Schulze, Paradise	Jersey	27/12/31
"	Balaklava Collegian's Bud	A. E. Middleton, Balaklava	"	30/12/31
"	Barina Negress Maid	L. H. and P. C. Giles, Auburn	Friesian	13/3/32
31101	Hampden Jessamine	E. W. Pfitzner, Eudunda	Jersey	12/10/31
31068	Eudunda Rene	W. S. McAuliffe, Eudunda	"	28/10/31
31144	Lanacoona Miss Kelly	C. E. Verco, Mount Compass	"	8/3/32
34278	Ear Park Rose	A. P. Spehr, Mount Gambier	"	21/10/31
Not allotted	Roseworthy Princess 41st	Agricultural College, Roseworthy	"	14/3/32
"	Wompini Leonia 7th	W. A. Pool, Cudlee Creek	"	3/11/31
34276	Willis Vale Twinkle	A. P. Spehr, Mount Gambier	"	8/10/31
31103	Hampden June	J. A. J. Pfitzner, Hampden	"	18/3/32
Not allotted	Balaklava Griselda Violet	A. E. Middleton, Balaklava	Friesian	23/10/31
31099	Hampden Carissa	J. A. J. Pfitzner, Hampden	Jersey	22/11/31
28091	Pella Jean Kelly	W. P. Eckermann, Eudunda	"	18/1/32
33593	Brookfield Verbena 18th	A. P. Spehr, Mount Gambier	"	11/11/31
Not allotted	Para Wirra Maglona 2nd	J. H. Dawkins, Gawler	"	25/11/31
31108	Hampden Melody	G. D. Oster, Balaklava	"	22/10/31
Not allotted	Kiama Pembroke's Olive	E. & A. Nicholls, Woodville	A.I.S.	9/12/31
31022	Channel View Rose	Mrs. A. M. Carruthers, Narrung	Jersey	4/3/32
Not allotted	Para Wirra Sunbeam 2nd	J. H. Dawkins, Gawler	"	25/3/32
2306	Sunnybrook Flirt's Rose	J. J. Farrow, Gawler	A.I.S.	28/10/31
Not allotted	Kyby Blossom	Government Farm, Kybybolite	Ayrshire	2/11/31
31094	Brinkworth Rhodora	C. C. T. Ottens, Brinkworth	Jersey	7/3/32
Not allotted	Kyby Roma	Government Farm, Kybybolite	Ayrshire	11/11/31
"	Tuela Swainsonia	F. Coleman, Saddleworth	Jersey	23/1/32
31081	Para Vale Lucy	A J. Marrett, Saddleworth	"	8/10/31
2346	Northfield Limelight's Blossom	Insp.-Gen. Hospitals, Northfield	A.I.S.	9/10/31
31112	Hampden Rhodesian Queen	J. A. J. Pfitzner, Hampden	Jersey	16/10/31
Not allotted	Ontario Viola	T. B. Brooks, Clarendon	"	10/3/32
31069	Eudunda Rhonda	W. S. McAuliffe, Eudunda	"	19/10/31
2309	Sunnybrook Swallow	J. J. Farrow, Gawler	A.I.S.	16/1/32
31093	Brinkworth Rae	C. C. T. Ottens, Brinkworth	Jersey	16/3/32
Not allotted	East View Charm	Insp.-Gen. Hospitals, Northfield	A.I.S.	5/11/31
"	Roseworthy Rosella	Agricultural College, Roseworthy	Jersey	10/3/32
28158	Wooroora King's Rosalind	A. B. Sieber, Eudunda	"	21/1/32
2799	Glenlea Wenonah 2nd	E. T. Vinall, Brighton	Guernsey	16/12/31
2533	Glenlea Fi Fi 3rd	E. T. Vinall, Brighton	"	2/1/32
21548	Glen Erin Wallflower	Ayrbrook Farm Ltd., Aldgate	Ayrshire	29/9/31
Not allotted	Talmont Peace	A. J. Manoel, Birdwood	"	9/10/31
"	Kyby Wanda	Government Farm, Kybybolite	"	30/9/31
2798	Glenlea Fi Fi 4th	E. T. Vinall, Brighton	Guernsey	23/12/31
2349	Northfield Limelight's Flirt 2nd	Insp.Gen. Hospitals, Northfield	A.I.S.	30/10/31
2348	Northfield Limelight's Flirt	Insp.-Gen. Hospitals, Northfield	"	12/3/32
2347	Northfield Limelight's Dora	Insp.-Gen. Hospitals, Northfield	"	13/10/31
Not allotted	Para Wirra Millie's Goldstream 3rd	J. H. Dawkins, Gawler	Jersey	26/1/32
"	Talmont Rosebud	A. J. Manoel, Birdwood	Ayrshire	4/11/31
38614	Woodside Dreaming Satisfaction	A. B. Sieber. Eudunda	Jersey	18/5/32
Not allotted	Oakhill Carmen	W. S. McAuliffe, Eudunda	"	13/7/32
38619	Woodside Mabel's Countess	A. B. Sieber, Eudunda	"	26/5/32
31037	Pella Amy Johnson	W. P. Eckermann, Eudunda	"	8/2/32
Not allotted	Hampden Precious	J. A. J. Pfitzner, Hampden	"	29/3/32
"	Lakeland Lady Grey	W. A. Pool, Cudlee Creek	"	11/7/32
"	Burnlea Moreen	J. M. Hudd, Bletchley	"	17/8/32
"	Glen Ewin Clementine	Jas. McEwin, Houghton	"	18/9/32
			SENIOR TWO-YEAR-OLDS.—	
Not allotted	Murray Glen Inka Olda	C. J. Morris, Monteith	Friesian	17/1/31
31102	Hampden Juanita	J. A. J. Pfitzner, Hampden	Jersey	28/3/32
28093	Pella Silver Lotus	W. P. Eckermann, Eudunda	"	1/2/32
Not allotted	Penrhyn Flavia 18th	W. S. McAuliffe, Eudunda	"	13/10/31
31030	Para Wirra Eileen 3rd	J. H. Dawkins, Gawler	"	28/2/32
31110	Hampden Rachel	J. A. J. Pfitzner, Hampden	"	25/12/31

FROM JULY 1ST, 1932, TO DECEMBER 31ST, 1932.

Age at Calving.		Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Yrs.	Days.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 230LBS.							
2	11	12,475½	3·32	414·63	273	Totara Pontiac Dainty Boy	—
2	137	13,480½	3·03	407·97	273	Lucindale Paul Indi	—
2	105	7,207½	5·56	400·95	273	Retford Julian	—
2	135	7,513½	5·28	396·68	273	Balaklava Skylee's Collegian	—
2	92	9,397½	4·12	386·78	273	Barina Woodcrest Paul	—
2	119	6,027	6·28	378·71	273	Maid's Success of Linden	—
1	211	5,701½	6·39	364·21	273	Ruby's Repulse of Hampden	—
1	278	6,726	5·26	354·00	273	Dalebank Noble Duke	—
2	45	6,166½	5·70	351·49	273	Alert of Farringdon	—
2	133	6,940½	5·04	349·62	273	Mercedes Sweet Duke of Glen Iris	—
2	116	6,354	5·50	349·31	273	Werribee Masterman	—
2	62	7,579½	4·61	349·21	273	Camellia's King of Willis Vale	—
1	290	5,769	5·89	339·95	273	Hampden Olive's King	—
1	359	10,518	3·21	337·56	273	Glenowie Beets Griselda	—
1	144	5,604	5·75	322·17	273	Hampden Olive's King	—
1	340	6,240	5·07	316·26	273	Melford's Butter Lad of Pella	—
2	14	5,850	5·35	312·77	273	Sweetbread's Duke of Glen Iris	—
2	20	5,772	5·24	302·60	273	Banyule Pylon	—
1	213	5,538	5·41	299·57	273	Hampden Olive's King	—
2	7	8,036	3·69	296·22	273	Pembroke of Greyleigh	—
2	53	6,123	4·83	295·87	273	Makarini of Dalebank	—
1	340	6,535½	4·51	295·07	273	Banyule Pylon	—
2	97	6,498	4·47	290·61	273	Illawarra Jellicoe's Belmont	—
2	16	6,721½	4·32	290·54	273	Loyalty of Bridge View	—
1	288	5,152½	5·58	287·51	273	General Chris of Penrhyn	—
2	50	6,198	4·52	280·45	273	Ida's Laird of Gowrie Park	—
2	133	5,379	5·14	276·57	273	Baron of Dalebank	—
1	271	6,160½	4·48	276·11	273	Dalebank Milklad 12th	—
2	13	6,385	4·22	269·30	273	Melba's Limelight of Wangara	—
1	239	4,885½	5·50	268·77	273	Repulse of Somerville	—
1	251	5,095	5·21	265·63	273	Dalebank Viola's Duke	—
1	251	4,827	5·49	264·99	273	Ruby's Repulse of Hampden	—
2	138	6,841½	3·70	253·03	273	Illawarra Jellicoe's Belmont	—
1	325	4,113	6·08	250·03	273	Hampden Olive's King	—
1	354	5,639½	4·35	245·43	273	Limit of East View	—
2	127	4,410	5·56	245·21	273	Mercedes Sweet Duke of Glen Iris	—
1	335	4,050	6·01	243·30	210	Wollingurry Cavalier's Silver King	Withdrawn
1	312	5,356½	4·45	238·20	273	Glenlea Hilda's Valour 2nd	—
2	98	4,005	5·94	237·86	273	Glenlea Hilda's Valour 2nd	—
2	59	5,863½	4·05	237·74	273	Reality of Olive Dale	—
1	349	6,216	3·78	234·94	273	Beleura Captain	—
2	115	4,980	4·41	219·64	273	Gowrie Park Scottish Dandy	—
1	342	4,497	4·86	218·68	273	Glenlea Hilda's Valour 2nd	—
1	275	5,266½	3·86	203·49	273	Melba's Limelight of Wangarra	—
2	82	4,936½	4·10	202·31	273	Melba's Limelight of Wangara	—
1	352	4,788	4·02	192·41	273	Melba's Limelight of Wangara	—
1	293	3,688½	5·20	191·77	273	Para Wirra Cherry's Makarini	—
2	78	4,311	4·19	180·76	273	Beleura Magician	—
2	45	3,690	4·87	179·56	150	Dreaming Bob	Withdrawn
1	251	2,280	5·18	118·05	90	Oakhill Carlos 2nd	Sold
1	259	2,655	4·35	115·38	150	Anemone's Lily Oxford	Withdrawn
1	225	2,400	4·45	106·81	150	Dalebank Noble Duke	Withdrawn
1	194	1,500	6·16	92·40	90	Repulse of Somerville	Sold
2	48	1,830	4·26	77·91	60	Timbungalung Lord Clement	Sold
2	125	1,290	5·26	67·83	60	Mack of Glenford	Withdrawn
1	238	1,020	5·52	56·33	60	Brucevale Lord Fancy Starbright	Sold
BUTTERFAT STANDARD, 250LBS.							
2	279	9,817½	4·40	432·42	273	River Glen Lord Echo Griselda	—
2	272	7,975½	5·29	422·21	273	Hampden Olive's King	—
2	261	7,006½	5·64	394·97	273	Wollingurry Cavalier's Silver King	—
2	364	8,436	4·59	387·63	273	Makarini 2nd of Dalebank	—
2	350	6,198	5·99	371·46	273	Para Wirra Chieftain	—
2	273	6,373½	5·53	352·6	273	Hampden Olive's King	—

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
SENIOR TWO-YEAR-OLDS.—BUTTERFAT				
31156	Scrub View Dainty's Lass	A. B. A. Weckert, Brinkworth	Jersey	—2/32
31033	Para Wirra Millie's Goldstream 2nd	J. H. Dawkins, Gawler	"	17/2/32
Not allotted	Murray Glen Griselda Mercury	C. J. Morris, Monteith	Friesian	21/11/31
28095	Pella Solanum's Majesty	W. P. Eckermann, Eudunda	Jersey	18/2/32
Not allotted	Sunnybrook Primrose	J. J. Farrow, Gawler	A.I.S.	9/10/31
"	Roseworthy Twilight	Agricultural College, Roseworthy	Jersey	15/3/32
31084	Oakhill Carnation 5th	Mrs. M. I. Neumann, Hampden	"	25/10/31
Not allotted	Kyby Snowdrop	Government Farm, Kybybolite	Ayrshire	28/10/31
31085	Oakhill Janet 4th	Mrs. M. I. Neumann, Hampden	Jersey	12/11/31
21833	Kyby Boronia 2nd	Government Farm, Kybybolite	Ayrshire	2/10/31
Not allotted	Roseworthy Princess 40th	Agricultural College, Roseworthy	Jersey	22/2/32
31127	Roseworthy Princess 38th	Agricultural College, Roseworthy	"	9/2/32
2351	Northfield Muirhead's Sunflower	Insp.-Gen. Hospitals, Northfield	A.I.S.	6/3/32
Not allotted	Road's End Corduene	W. Hawker, Clare	Freisian	20/5/32
"	Road's End Corsia	W. Hawker, Clare	"	14/5/32
"	Hero's Handsome 4th of Illawarra	A. Snell, Bolivar	A.I.S.	1/4/32
31135	Havee Linda	A. B. Sieber, Eudunda	Jersey	16/7/32
JUNIOR THREE-YEAR-OLDS—				
Not allotted	Anama Segis Bloom	W. Hawker, Clare	Freisian	31/10/31
"	Murray Glen Netherland Buttergirl	C. J. Morris, Monteith	"	10/2/32
"	Murray Glen Netherland Butterfly	C. J. Morris, Monteith	"	23/11/31
"	Murray Glen Netherland Princess	C. J. Morris, Monteith	"	28/2/32
31122	Roseworthy Fay	Agricultural College, Roseworthy	Jersey	28/2/32
31076	Wompini Moss Rose	Jas. McEwin, Houghton	"	14/1/32
28145	Delma Countess	E. W. Pfitzner, Eudunda	"	18/1/32
28094	Pella Solanum	W. P. Eckermann, Eudunda	"	16/3/32
Not allotted	Bess 4th of Kiama	E. & A. Nicholls, Woodville	A.I.S.	9/11/31
31118	Wompini Jazz Girl	W. A. Pool, Cudlee Creek	Jersey	5/3/32
31126	Roseworthy Princess 37th	Agricultural College, Roseworthy	"	26/2/32
31125	Rossworthy Princess 36th	Agricultural College, Roseworthy	"	25/2/32
13111	Lady 6th of Melross	Dunleith Pastoral Co., Ashbourne	A.I.S.	3/10/31
21832	Kyby Bess	Government Farm, Kybybolite	Ayrshire	3/1/32
21839	Kyby Rose 4th	Government Farm, Kybybolite	"	7/10/31
31128	Roseworthy Roselar	Agricultural College, Roseworthy	Jersey	22/3/32
21834	Kyby Judy	Government Farm, Kybybolite	Ayrshire	1/1/32
18359	Mayflower Jellicoe 4th of Illawarra	A. Snell, Bolivar	A.I.S.	13/10/31
31121	Myrtle Bank Eileen 2nd	W. A. Rodda, Brooklyn Park	Jersey	25/11/31
21835	Kyby Leila	Government Farm, Kybybolite	Ayrshire	18/12/31
Not allotted	Kyby Maggie 4th	Government Farm, Kybybolite	"	15/3/32
20997	Angle Farm Petunia	Ayrbrook Farm Ltd., Aldgate	"	13/1/32
Not allotted	Road's End Cortona	W. Hawker, Clare	Friesian	15/5/32
SENIOR THREE-YEAR-OLDS—				
24857	Wooroora Bonnie Pearl	A. B. Sieber, Eudunda	Jersey	7/2/32
28163	Morella Belle 3rd	E. L. Goode, Narrung	"	9/1/32
28136	Barton Croft Sweetbriar	A. J. Marrett, Saddleworth	"	7/3/32
28084	Para Wirra Millie's Beauty	J. H. Dawkins, Gawler	"	31/1/32
25051	Roseworthy Erudite 2nd	Agricultural College, Roseworthy	"	6/3/32
17880	Toora Lucy 2nd	Insp.-Gen. Hospitals, Northfield	A.I.S.	5/10/31
28169	Morella Starbright	E. L Goode, Narrung	Jersey	20/12/31
30247	Retford Jersey Princess	H. R. Walsh, Salisbury	"	17/9/32
JUNIOR FOUR-YEAR-OLDS—				
24959	Pella Lorna Doone	W. P. Eckermann, Eudunda	Jersey	23/2/32
31006	Melvin Lady	A. Schulze, Paradise	"	6/1/32
19509	Beleura Primrose 3rd	A. J. Manoel, Birdwood	Ayrshire	9/1/32
Not allotted	Glenowie Inka May	H. Mountstephen, Monteith	Friesian	15/11/31
23588	Eudunda Merden's Damsel	W. S. McAuliffe, Eudunda	Jersey	23/11/31
Not allotted	Glenowie Echo Mercena	H. Mountstephen, Monteith	Friesian	25/2/32
29481	Wompini First Clementine	Jas. McEwin, Houghton	Jersey	29/1/32
18357	Hero's Handsome 3rd of Illawarra	A. Snell, Bolivar	A.I.S.	30/11/31
29484	Wompini Lady Jane Grey	W. A. Pool, Cudlee Creek	Jersey	18/1/32
31020	Ontario Millie	T. B. Brooks, Clarendon	"	8/10/31
19486	Beleura Gayribbon 2nd	A. J. Manoel, Birdwood	Ayrshire	6/12/31
1758	Glenlea Fi Fi	E. T. Vinall, Brighton	Guernsey	25/10/31
18424	Kyby Maggie 3rd	Government Farm, Kybybolite	Ayrshire	10/3/32
Not allotted	Bloomfield Alcartra Sunshine	W. Hawker, Clare	Friesian	12/3/32
19411	Angle Farm Elsie	Ayrbrook Farm Ltd., Aldgate	Ayrshire	11/10/31
28087	Para Wirra Sunbeam	J. H. Dawkins, Gawler	Jersey	10/2/32
19416	Angle Farm Tulip	Ayrbrook Farm Ltd., Aldgate	Ayrshire	23 4/32

OFFICIAL TEST—*continued.*

Age at Calving. Yrs.	Days.	Total Milk. Lbs.	Average Test. %	Total Butter-fat. Lbs.	Days Tested.	Sire.	Remarks.
STANDARD, 250LBS.—*continued.*							
2	9m.	7,014	5·02	351·76	273	Holly's King of Hampden	—
2	352	7.102½	4·90	347·75	273	Para Wirra Chieftain	—
2	294	9,523½	3·42	325·71	273	River Glen Lord Echo Griselda	—
2	359	5,671½	5·49	311·50	273	Melford's Butter Lad of Pella	—
2	314	7,492½	3·95	295·87	273	Illawarra Jellicoe's Belmont	—
2	249	5,043	5·41	272·82	273	Courtier of Dalebank	—
2	264	5,295	4·98	263·77	273	Dalebank Carnation's Lad	—
2	191	5,940	4·29	254·87	273	Gowrie Park Scottish Dandy	—
2	231	5,872½	4·19	246·07	273	Dalebank Carnation's Lad	—
2	259	5,787	4·17	241·19	273	Ida's Laird of Gowrie Park	—
2	212	5,230½	4·49	234·73	273	Roseworthy Templar	—
2	302	3.774	6·13	231·31	273	King Solomon of Dalebank	—
2	259	5,229	4·04	211·50	273	Melba's Limelight of Wangara	—
2	324	7,200	2·10	151·55	120	Rosevale Korndyke Sylvia Posch	Sold
2	319	5,790	2·15	124·75	120	Rosevale Korndyke Sylvia Posch	Sold
2	207	3,285	3·17	104·18	150	Illawarra Noble	Dried off
2	279	900	6·33	56·93	60	Hampden Carnation's Lad	Died
BUTTERFAT STANDARD 270 LBS.							
3	3	16,039½	3·18	509·94	273	Inavale Lady's Pride	—
3	139	11,626½	4·01	466·22	273	Longbeach Netherland King 2nd	—
3	71	11,482½	3·52	404·69	273	Longbeach Netherland King 2nd	—
3	107	10,954½	3·69	403·89	273	Longbeach Netherland King 2nd	—
3	112	6,013½	5·56	334·35	273	King Solomon of Dalebank	—
3	51	5,505	5·91	325·36	210	Wompini Noble	Withdrawn
3	122	6,298½	5·16	324·79	273	Thora's Renown of Hampden	—
3	128	6,984	4·50	314·60	273	Melford's Butter Lad of Pella	—
3	141	8.407	3·74	314·39	273	Sultan of East View	—
3	123	5.475	5·70	311·99	273	Wompini Noble	—
3	88	5,200½	5·88	306·04	273	King Solomon of Dalebank	—
3	112	5,392½	5·50	296·67	273	Roseworthy Twylish	—
3	118	6,945	4·04	280·84	273	Dainty's Triumph of Melross	—
3	60	7,209	3·85	277·69	273	Loyalty of Bridge View	—
3	154	6,832½	3·94	269·41	273	Loyalty of Bridge View	—
3	179	5,346	4·84	258·57	273	Roseworthy Templar	—
3	54	5,245½	4·71	247·23	273	Gowrie Park Scottish Dandy	—
3	53	5,841	4·03	235·55	273	Fussey's Jellicoe of Hill View	—
3	81	3,871½	5·05	195·68	273	Khedive of Woodside	—
3	26	4,815	3·76	180·94	240	Gowrie Park Scottish Dandy	Dried off
3	26	5,160	3·49	179·87	210	Loyalty of Bridge View	Dried off
3	131	3,705	3·99	147·89	210	Angle Farm Progress	Dried off
3	22	6,945	1·90	132·09	120	Rosevale Korndyke Sylvia Posch	Sold
BUTTERFAT STANDARD 290LBS.							
3	263	9,510	4·94	469·97	273	Melford's Butter Lad of Pella	—
3	242	8,652	4·66	403·09	273	Anemone's Chief of Morella	—
3	343	7,195½	5·46	392·73	273	Rambler 2nd of Linden	—
3	183	6,417	5·81	372·56	273	Molly 5th's Audrey Twylish of Banyule	—
3	349	5,866½	6·30	369·86	273	King Solomon of Dalebank	—
3	259	6,191	3·93	243·18	273	Iris 5th's Superb of Toora	—
3	223	5,436	4·46	242·57	273	Anemone's Chief of Morella	—
3	198	840	5·00	42·02	30	Retford Jersey King	Died
BUTTERFAT STANDARD 310LBS							
4	6	8,767½	5·22	457·48	273	Melford's Butter Lad of Pella	—
4	83	7,648½	5·87	449·02	273	Retford Julian	—
4	182	10,165½	4·27	434·23	273	Sun of Beleura	—
4	50	13,059	3·20	418·44	273	River Glen Sir Pietje Griselda	—
4	164	7,603½	5·23	397·83	273	Lord Merden of Endunda	—
4	130	11,898	3·34	396·83	273	Glenowie Beets Griselda	—
4	57	6,153	6·04	371·69	273	Werribee Masterman	—
4	63	7,659	4·38	335·58	273	Fussy's Hero of Hill View	—
4	122	5,430	5·67	307·98	210	Werribee Masterman	Dried off
4	80	5,469	5·52	301·83	273	Molly 5th's Audrey Twylish of Banyule	—
4	147	6,160½	4·68	288·53	273	Sun of Beleura	—
4	152	7,072½	4·06	286·93	273	Glenlea Vera's Valour 2nd	—
4	102	6,952½	3·92	272·32	273	Loyalty of Bridge View	—
4	85	8,374½	3·15	264·18	273	Bloomfield Alcartra Clothilde	—
4	93	5,958	3·63	216·28	273	Angle Farm Liberty	—
4	41	3,967½	5·38	213·35	273	Twylish of Para Wirra	—
4	132	2,955	3·86	114·15	150	Angle Farm Trick	Withdrawn

PURE-BRED COWS COMPLETED

Herd Book No.	Name of Cow.	Owner.	Breed.	Calved.
			SENIOR FOUR-YEAR-OLDS.—	
23553	Dalebank Carnation 4th	J. M. Bray, Langhorne's Creek....	Jersey	28/9/31
18328	Olive 3rd of Kiama.............	E. & A. Nicholls, Woodville	A.I.S.	22/11/31
18329	Pembroke's Roma of Kiama	E. & A. Nicholls, Woodville	"	21/10/31
23569	Pella Butter Queen	W. P. Eckermann, Eudunda......	Jersey	24/2/32
24833	Burnlea Aileen................	J. M. Hudd, Bletchley	"	8/2/32
23603	Hampden Rae	J. A. J. Pfitzner, Hampden.......	"	7/2/32
Not allotted	Glenowie Plus Triumph	H. Mountstephen, Monteith	Friesian	28/10/31
24843	Penrhyn Lady McEwin 23rd......	Mrs. A. M. Carruthers, Narrung ..	Jersey	2/12/31
24847	Penrhyn Rosebud 22nd	Mrs. A. M. Carruthers, Narrung ..	"	14/1/32
19494	Beleura Mab 2nd...............	A. J. Manoel, Birdwood	Ayrshire	7/2/32
23641	Morella Damsel 2nd	E. L. Goode, Narrung	Jersey	20/10/31
28146	Hill Farm Belona 2nd	E. W. Pfitzner, Eudunda.........	"	22/9/32
			MATURE COWS—BUTTERFAT	
20745	Enchantress of Dalebank.........	J. M. Bray, Langhorne's Creek....	Jersey	6/12/31
24701	Pella Gipsy Lotus...............	E. W. Pfitzner, Eudunda.........	"	14/1/32
2502	Murray Glen Griselda's Patch.....	C. J. Morris, Monteith	Friesian	17/3/32
23622	Roseworthy Princess 26th	Agricultural College, Roseworthy..	Jersey	16/3/32
2256	River Glen Galatea Konigen	L. H. & P. C. Giles, Auburn	Friesian	26/11/31
19077	Roseworthy Fairy	Agricultural College, Roseworthy..	Jersey	27/2/32
24979	Cumberland Twilight	E. W. Pfitzner, Eudunda.........	"	13/3/32
14633	Belle of Morella	H. R. Walsh, Salisbury	"	23/12/31
1587	Henley Sylvia Butterfly	C. J. Morris, Monteith	Friesian	28/1/32
24846	Penrhyn Lady Marge 9th	Mrs. A. M. Carruthers, Narrung ..	Jersey	16/1/32
1589	Henley Tulip 3rd	C. J. Morris, Monteith	Friesian	14/1/32
20817	Rosemary of Waterfall	A. E. Middleton, Balaklava	Jersey	30/9/31
17919	Pimpernel 4th of Oakhill	Mrs. M. I. Neumann, Hampden ..	"	28/3/32
23619	Roseworthy Lady 2nd	Agricultural College, Roseworthy .	"	25/2/32
24694	Pembroke Sylvia	Mrs. C. W. Ansell, Bletchley	"	15/1/32
2499	Murray Glen Echo Sylvia	C. J. Morris, Monteith	Friesian	3/2/32
12844	Queen of Hampden	J. A. J. Pfitzner, Hampden	Jersey	5/3/32
23628	Roseworthy Roseal	Agricultural College, Roseworthy .	"	22/3/32
25609	Wompini Gaiety Girl	W. A. Pool, Cudlee Creek	"	13/10/31
20849	Roseworthy Princess 21st	Agricultural College, Roseworthy .	"	15/3/32
16803	Cherry 10th of Willow Farm	J. H. Dawkins, Gawler	"	24/10/31
14973	Kingston's Bloom 2nd of Wangara	E. A. Groth, Walker's Flat	A.I.S.	29/10/31
24699	Brucevale Molly Madeira 3rd	Jas. McEwin, Houghton	Jersey	21/1/32
14706	Kyby Bonny	Government Farm, Kybybolite ..	Ayrshire	20/2/32
Not allotted	Bess 2nd of Kiama	E. & A. Nicholls, Woodville	A.I.S.	27/10/31
14242	Velvet of Beleura	A. J. Manoel, Birdwood	Ayrshire	18/10/31
2261	River Glen Rosey	L. H. and P. C. Giles, Auburn ...	Friesian	4/11/31
20786	Lady Grey 13th of Penrhyn	Mrs. A. M. Carruthers, Narrung ..	Jersey	28/9/31
24696	Para Wirra Lady Iris	J. H. Dawkins, Gawler	"	21/1/32
18330	Primrose of Kiama	E. & A. Nicholls, Woodville	A.I.S.	14/11/31
13416	Topaz of Kybybolite	Government Farm, Kybybolite ..	Ayrshire	3/1/32
2344	Northfield Blossom	Insp.-Gen. Hospitals, Northfield ..	A.I.S.	20/12/31
2462	Glenowie Pietje Patch	H. Mountstephen, Monteith	Friesian	2/10/31
15974	Eldorado Queenie	Ayrbrook Farm, Ltd., Aldgate ...	Ayrshire	8/10/31
24864	Fernden Princess Madeira	A. J. Marrett, Saddleworth	Jersey	10/2/32
9017	Rose of Kybybolite	Government Farm, Kybybolite ..	Ayrshire	27/10/31
19043	Prettymaid of Dalebank	W. A. Pool, Cudlee Creek	Jersey	20/11/31
18759	Oakbank Olive	J. O. Robinson, Meadows	Ayrshire	2/11/31
15584	Beleura Colleen 2nd	A. J. Manoel, Birdwood	"	26/2/32
15191	Oakbank Aspect	J. O. Robinson, Meadows	"	15/11/31
16824	Glen Ewin Columbine's Lady 5th .	A. J. Marrett, Saddleworth	Jersey	27/2/32
13846	Noble Lass of Dalebank..........	A. Schulze, Paradise	"	2/2/32
10952	Olive 2nd of Kiama	E. & A. Nicholls, Woodville	A.I.S.	4/12/31
23557	Dalebank Fairy Queen 3rd	A. J. Marrett, Saddleworth	Jersey	8/3/32
25006	Mrytle Bank Eileen	W. A. Rodda, Brooklyn Park	"	16/2/32
20791	Penrhyn Lady McEwin 19th......	A. J. Marrett, Saddleworth	"	5/4/32
9015	Maggie of Kybybolite...........	Government Farm, Kybybolite ...	Ayrshire	15/11/31
16826	Lassie Fowler 4th of Willow Farm	A. J. Marrett, Saddleworth	Jersey	6/3/32
2349	Balaklava Pride's Violet	A. E. Middleton, Balaklava	Friesian	5/1/32
16385	Kyby Boronia	Government Farm, Kybybolite ...	Ayrshire	13/2/32
20734	Diosma II. of Tuela	F. Coleman, Saddleworth	Jersey	28/11/31
15032	Flirt of Northfield	Insp.-Gen. Hospitals, Northfield ..	A.I.S.	7/2/32
10595	Princess Audrey of Pella	A. B. Sieber, Eudunda	Jersey	26/5/32
18693	Oakbank Aim	Government Farm, Kybybolite ...	Ayrshire	8/1/32
15034	Princess 2nd of Ben Lomond	Insp.-Gen. Hospitals, Northfield ..	A.I.S.	19/12/31
10923	Molly Jellicoe of Illawarra........	A. Snell, Bolivar	A.I.S.	20/8/32
Not allotted	Eudunda Pearl	Mrs. A. M. Carruthers, Narrung ..	Jersey	15/7/32
18201	Topsy 4th of Lossie	A. N. McArthur, Millicent	A.I.S.	12/8/32
18426	Kyby Rarity	Government Farm, Kbybolite	Ayrshire	16/9/32
28072	Tuela Hibiscus.................	F. Coleman, Saddleworth	Jersey	8/8/32
19058	Columbine's June of Glen Ewin ..	Jas. McEwin, Houghton	"	1/10/32
		THE FOLLOWING COWS HAVE NOW COMPLETED 365 DAYS TEST.		
1850	East View Dorain Pauline	H. Mountstephen, Monteith	Friesian	27/9/31
2463	Glenowie Plus Olda	H. Mountstephen, Monteith	"	28/8/31

OFFICIAL TEST—*continued.*

Age at Calving.		Total Milk.	Average Test.	Total Butter-fat.	Days Tested.	Sire.	Remarks.
Yrs.	Days.	Lbs.	%	Lbs.			
BUTTERFAT STANDARD, 330LBS.							
4	244	8,302½	5·54	459·66	273	Twylish of Dalebank	—
4	8m.	12,122	3·48	421·49	273	Pembroke of Greyleigh	—
4	276	11,961½	3·31	396·48	273	Pembroke of Greyleigh	—
4	305	6,552	5·71	373·87	273	Werribee Starbright's Fancy	—
4	274	6,412½	5·81	372·35	273	Mack of Glenford	—
4	270	7,218	5·14	370·80	273	Carnation's Lad of Dalebank	—
4	331	10,572	3·37	356·29	273	River Glen Sir Pietje Griselda	—
4	340	6,541½	5·09	333·26	273	Bramble's Lord of Linden	—
4	322	6,672	4·64	309·59	273	Bramble's Lord of Linden	—
4	208	6,832½	4·08	278·66	273	Sun of Beleura	—
4	228	5,979	4·19	250·56	273	Anemone's Chief of Morella	—
4	257	2,085	5·40	112·62	60	Oliver of Hampden	Withdrawn
STANDARD, 350LBS.							
6	53	11,056½	5·42	599·55	273	Baxter of Banyule	—
5	148	10,491½	5·34	560·38	273	Governor Grey of Pella	—
6	—	13,000½	4·30	559·15	273	River Glen Lord Echo Griselda	—
5	117	8,530½	5·99	511·28	273	Courtier of Dalebank	—
7	83	16,540½	3·08	509·62	273	Konigen Pietertje Lad	—
		20,460	3·08	630·00	365		
7	121	9,435	5·05	476·63	273	King Solomon of Dalebank	
6	37	8,038½	5·77	463·87	273	King Chris of Penrhyn	—
8	329	8,194½	5·32	435·81	273	Chief of Kiama	—
9	15	12,997½	3·35	435·54	273	Rosevale Inka Sylvia Beets	—
5	96	8,275½	5·20	430·18	273	Socrates of Rockness	—
9	207	9,937½	4·29	426·27	273	Black and White King	—
8	250	8,484	4·93	418·55	273	Major Grey of Waterfall	—
7	189	6,469½	6·43	415·89	273	Grey Sprite of Linden	—
5	184	7,906½	5·21	411·72	273	Courtier of Dalebank	—
5	60	6,922½	5·95	411·61	273	Triumph 2nd of Dalebank	—
6	76	12,078	3·38	408·23	273	River Glen Lord Echo Griselda	—
9	210	8,052	5·05	406·96	273	Beauty's King of Somerville	—
5	120	7,042½	5·66	398·37	273	Courtier of Dalebank	—
5	14	7,696½	5·12	393·90	273	Werribee Masterman	—
6	111	6,952½	5·54	385·19	273	King Solomon of Dalebank	—
9	108	7,978½	4·73	377·34	273	Lord Silvermine 9th of Banyule	—
5	268	8,895	4·20	373·86	273	Kingston of Sunnyvale	—
5	32	5,911½	6·14	362·72	273	Masterpiece of Brucevale	—
7	12	8,836½	4·03	356·16	273	Loyalty of Bridge View	—
5	205	10,095	3·50	353·46	273	Pembroke of Greyleigh	—
7	326	9,781½	3·59	351·02	273	Prince of Range View	—
6	298	10,557	3·32	350·91	273	Rosevale Inka Sylvia Beets	—
6	124	6,793½	5·16	350·61	273	Bramble's Lord of Linden	—
5	162	5,493	6·33	347·94	273	Para Wirra Twylish	—
5	120	8,716½	3·87	337·50	273	Pembroke of Greyleigh	—
7	201	7,576½	4·41	334·28	273	Loyalty of Bridge View	—
9	317	8,672½	3·85	334·00	273	Somerset	—
5	352	9,555	3·49	333·50	273	River Glen Sir Pietje Griselda	—
5	15	8,125½	3·98	323·49	273	Problem of The Valley	—
5	119	6,207	5·02	311·73	273	Werribee Combination	—
11	342	8,305½	3·74	310·72	273	Anthony of Gleneira	—
6	319	7,552½	4·06	306·90	273	Baxter of Banyule	—
5	43	7,594½	4·04	306·75	273	Aerial of Oakbank	—
6	140	6,990	4·29	299·92	240	Eurythmic of Glengowrie	Dried off
6	267	7,137	4·18	298·00	273	Lordly of Oakbank	—
8	182	5,896½	4·95	291·65	273	Trixie's Lad of Glen Ewin	—
9	149	5,445	5·30	288·72	210	Noble Mike 2nd of Dalebank	Withdrawn
6	140	7,857½	3·61	283·75	273	Pembroke of Greyleigh	—
5	238	5,997	4·69	281·08	273	Baxter of Banyule	—
5	27	4,554	6·12	278·52	273	Fawn Chief of Carrickalinga	—
6	333	5,910	4·69	277·38	240	Bramble's Lord of Linden	Dried off
12	—	7,287	3·78	275·40	273	Anthony of Gleneira	—
8	250	5,493	4·92	270·25	273	Lord Silvermine 9th of Banyule	—
6	267	7,260	3·51	254·96	180	Pride's King Rock of Brundee	Withdrawn
5	96	5,985	4·25	254·58	240	Loyalty of Bridge View	Sold
8	137	4,854	4·92	238·74	273	Admiral 2nd of Dalebank	—
5	83	4,855	4·17	202·22	240	Janet's Hayliss of Ben Lomond	Dried off
11	10	3,810	4·85	184·88	150	Princess' Lad	Withdrawn
6	110	4,080	4·46	181·95	180	Summit of Lady Bank	Dried off
5	159	4,012½	3·62	145·23	210	Janet's Hayliss of Ben Lomond	Dried off
6	348	2,625	3·96	104·03	60	Fussey's Jellicoe of Hill View	Sold
6	37	1,830	4·36	79·80	60	Statesman 3rd of Linden	Sold
6	130	2,580	3·05	78·67	90	Majestic of East View	Exemption
5	16	1,515	3·68	55·77	30	Ida's Laird of Gowrie Park	Sold
6	59	870	5·69	49·50	30	Maid's Success of Linden	Exemption
7	122	1,185	3·58	42·48	30	Trixie's Lad of Glen Ewin	Sold
RESULTS FOR 273 DAYS TEST PUBLISHED PREVIOUS HALF-YEARLY LIST—							
7	197	14,140	4·45	629·23	365	St. Alban's Helen's Woodcrest Paul	—
6	58	19,272½	3·03	580·40	365	Henley Plus Colantha	—

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Dec.	Per Cow during Dec.	Per Cow July to Dec.	Per Herd during Dec.	Per Cow during Dec.	Per Cow July to Dec.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E .	25	22·03	20,638½	825·27	3,734·62	814·78	32·59	153·77	3·98
7/H .	9	7·03	4,806½	534·06	3,837·30	242·14	26·90	194·95	5·04
7/K .	21·42	19·42	16,693	779·32	5,024·69	688·46	32·14	206·45	4·12
7/L .	34·58	31·23	25,298½	731·08	3,889·73	1,082·96	31·30	186·40	4·26
7/T .	14	14	7,610½	543·61	3,474·37	352·00	25·14	156·39	4·63
7/W .	19	19	14,740½	775·82	4,406·87	628·49	33·08	185·17	4·26
7/Y .	24	20·06	14,665½	610·81	3,903·74	660·35	27·51	183·29	4·50
7/Aa	14	13·23	8,847	631·93	3,374·82	388·96	27·78	166·42	4·40
7/Hh	17	15·71	14,408	847·53	3,413·43	596·65	35·10	147·73	4·14
7/Kk	18·35	15·52	13,522½	736·92	4,182·92	553·70	30·17	174·98	4·09
7/Mm	37	36·52	28·707	775·86	5,109·38	1,160·48	31·36	197·70	4·04
7/Nn.	23·68	21·52	17,462	737·41	4,691·34	703·77	29·72	182·09	4·03
7/Oo	15·45	15·19	11,282½	731·10	4,352·09	512·97	33·24	204·60	4·55
7/Pp	20	18	13,438½	671·93	4,314·81	677·33	33·87	236·12	5·04
7/Qq	16	14	9,393	587·06	3,201·27	491·38	30·71	181·13	5·23
7/Tt	18	14·97	12,347½	685·97	4,121·23	524·77	29·15	187·02	4·25
7/Uu.	22	19·77	12,446½	565·75	3,792·64	605·86	27·54	174·62	4·87
7/Vv	13·48	12	8,233	622·99	4,691·82	414·30	29·60	232·82	4·43
7/Xx	20·48	19·03	16,008	781·64	4,864·16	883·05	43·12	267·76	5·52
7/Yy.	20	18·68	12,145½	607·28	3,307·46	521·97	26·10	145·94	4·30
7/Aaa	10	9·26	3,713½	371·35	2,199·83	168·30	16·83	99·93	4·53
Means	19·64	17·91	13,686·05	696·85	4,056·58	603·46	30·73	184·12	4·41

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER, 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during Dec.	Per Cow during Dec.	Per Cow October to Dec.	Per Herd during Dec.	Per Cow during Dec.	Per Cow October to Dec.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	33	29·97	19,393½	587·68	2,114·56	996·31	30·19	108·37	5·14
5/D .	32	27·42	19,916½	597·39	2,064·70	1,023·68	31·99	114·05	5·35
5/E .	42·61	39·03	22,571	529·71	1,920·65	1,203·84	28·25	104·79	5·33
5/P .	32	29·23	20,931½	654·11	2,027·45	932·93	29·15	99·56	4·46
5/R .	69	60·42	26,064½	379·44	1,492·31	1,056·75	15·39	61·53	4·04
5/S ..	21	19·29	10,433½	496·83	1,641·75	476·17	22·67	79·76	4·56
5/Y .	29	26·23	19,051½	656·95	1,843·10	934·79	32·24	95·90	4·92
5/Z ..	40·16	37·13	27,654	688·59	2,158·85	1,293·06	32·20	104·20	4·68
5/Ee	18	18	12,849½	713·86	2,669·50	651·24	36·18	128·96	5·07
5/Gg	23	18·48	9,091	395·26	1,314·45	397·19	17·27	62·31	4·37
5/Ii .	32	26·81	22,265	695·78	2,031·44	1,009·94	31·56	98·87	4·54
5/Jj .	24	23	16,027	667·79	2,401·51	692·49	28·85	103·27	4·32
5/Kk	20	16·13	8,949½	447·48	1,607·91	383·79	19·19	74·44	4·29
5/Nn.	24·48	21·55	15,806½	645·69	2,376·62	738·49	30·17	111·89	4·67
5/Oo	20·65	17·71	11,462½	555·08	2,104·41	531·85	25·76	96·69	4·64
5/Qq	19	16·29	10,126	532·95	1,487·62	527·61	27·77	82·38	5·21
5/Rr	23·23	20·55	7,278	313·33	1,358·62	429·58	18·50	80·38	5·90
5/Ss .	15·13	14·13	8,907	588·69	1,977·85	416·49	27·53	90·29	4·68
5/Tt	10	10	6,153½	615·35	2,377·67	302·25	30·23	123·93	4·91
5/Uu.	23	19·48	9,402	408·78	1,608·89	402·33	17·49	72·00	4·28
5/Vv	22	20·29	10,370½	471·38	2,150·40	476·88	21·68	96·70	4·60
Means	27·30	24·34	14,947·81	547·58	1,907·14	708·46	25·95	92·88	4·74

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR DECEMBER 1932.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.		Butterfat.		Average Test.
			Per Herd during Dec.	Per Cow during Dec.	Per Herd during Dec.	Per Cow during Dec.	
			Lbs.	Lbs.	Lbs.	Lbs.	%
6/A	20	19	11,764½	588·23	554·52	27·73	4·71
6/B	18·45	18·13	8,443½	457·64	388·12	21·04	4·60
6/C	16	16	11,470	716·87	521·45	32·59	4·55
6/F	25	22·42	15,936½	637·46	766·87	30·67	4·81
6/H	25	25	16,306	652·24	732·70	29·31	4·49
6/Y	13	10·90	7,052	542·46	319·31	24·56	4·53
6/Ii	30	21·13	17,344	578·13	732·74	24·42	4·22
6/Ll	20·65	15·10	12,763½	618·08	516·41	25·01	4·05
6/Oo	17	17	17,220½	1,012·97	762·55	44·86	4·43
6/Pp	15	11·48	8,265	551·00	400·20	26·68	4·84
6/Qq	25	22·90	25,802½	1,032·10	1,105·03	44·20	4·28
6/Rr	29	24·19	24,064½	829·81	1,021·41	35·22	4·24
6/Tt	19·16	18·03	15,944½	832·17	705·52	36·82	4·42
6/Vv	20·84	18·84	19,948	957·19	942·28	45·21	4·72
6/Xx	24	19·42	19,373½	807·23	798·10	33·25	4·12
6/Yy	31·58	25·58	17·296½	547·70	840·88	26·63	4·86
6/Zz	26·97	25·84	22,105	819·61	967·39	35·87	4·38
6/Aaa	21·04	21·06	10,332	470·92	546·56	24·91	5·29
6/Bbb	24	21·16	19,886	828·58	805·11	33·55	4·05
6/Ccc	19·61	19·61	15,397½	785·18	634·42	32·35	4·11
6/Ddd	20	19·87	15,010½	750·53	702·59	35·13	4·68
6/Eee	24	23·10	25,466½	1,061·10	999·79	41·66	3·93
6/Fff	20·94	20·26	17,287½	825·57	736·38	35·17	4·26
6/Ggg	23	16·55	18,127½	788·15	742·45	32·28	4·10
Means	22·09	19·69	16,358·63	740·57	718·45	32·52	4·39

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1933.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

BLACK MINORCAS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

Free on Rail, Salisbury.

DELIVERY.—CHICKS—February and Early March.
EGGS—January and February.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

ADVISORY BOARD OF AGRICULTURE.

The Monthly Meeting of the Advisory Board of Agriculture was held on January 25th, there being present Messrs. H. N. Wicks (Chairman), A. J. Cooke (Vice-Chairman), A. M. Dawkins, P. J. Baily, S. Shepherd, A. L. McEwin, F. Coleman, J. B. Murdoch, Professor A. J. Perkins (Director of Agriculture), and H. C. Pritchard (Secretary). Apologies were received from Messrs. J. W. Sandford and Dr. A. E. V. Richardson.

Reduction in Price of Superphosphate.—In accordance with the resolution carried at the 1932 Annual Congress, the Secretary communicated with the manufacturers of superphosphate in South Australia requesting them to give consideration to a reduction in the price of this fertiliser for the coming season. In reply to the Board's letter, the manufacturers pointed out that in view of the increase in the cost of all materials—except phosphate rock—used in the manufacture of superphosphate, little hope could be held out for any reduction. It was also stated that despite the increase in cost of raw materials present prices were 14·7 per cent. less than those ruling in 1913-14, which statement was borne out by the report on the Superphosphate Industry made last year by the Hon. John Gunn, of the Prime Minister's Development Department. On the suggestion of Mr. Murdoch it was decided that members of the Bureau should be advised through the *Journal* that primary producers, in respect of the production of primary produce other than wheat, would be paid 15s. per ton for each ton of artificial manure used during the year ending November 30th, 1933.

Life Membership.—The name of Mr. A. C. Jarvis, of the Berri Branch, was added to the roll of Life Members of the Agricultural Bureau.

March Meeting.—It was decided that the March meeting should be held at the Blackwood Orchard.

New Branches.—Approval was given for the formation of Branches of the Bureau at Mundalla (Women's), Chilpuddie Rocks, and Adelaide, with the following foundation members :—*Mundalla Women's*—Mesdames J. Werner, W. Golding, D. Kemp, J. and A. Staude, F. Trenorden, E. Packer, W. Dinning, R. Golding, W. Jones, L. Fisher, L. Humphrys, —. Pavier, L. Beare, Misses K. Hillier, E. Gill, B. and L. Tremain, L. and D. Carson. *Chilpuddie Rocks*—H. Cockrane, H. Brown, A. Miller, R. Redding, W. Richards, G. Phillips, G. Russell, A. Rodd, J. Schulz, F. Herde, H. Hebbington, G. Hebberman, A. Wagner, A. Cox, C. Page, H. McPhail, K. Ward, and D. Caust. *Adelaide.*—J. Burns, S. Church, —. Devitt, D. Fitzgerald, A. Ferguson, A. Foster, H. Hill, C. Horton, L. Howard, F. Hughes, J. Hudd, J. Hewland, W. Lindquist, A. Toogood, B. Temmons, R. Mortimer, W. Osborne, E. Vinal, W. Buchanan, and O. Ayton.

Conditional approval was granted to the formation of a Women's Branch at Kybybolite.

New Members.—The following names were added to the rolls of existing Branches :—Balumbah—A. J. Swann, J. Franklin, A. Franklin, A. A. Jericho, S. G. Jericho, N. A. Jericho, H. Ellis, W. H. Riches, W. B. Riches, W. L. P. Norris, L. Stutley, S. Mesman, R. C. Counsel, J. B. Marinho, J. E. Swann, A. B. Davis, P. Franklin ; Greenock—C. Laucke ; Hindmarsh Island—Les. Hann ; Hope Forest—W. McNeil, V. DeCaux ; Clarendon— — Winham, Rev. W. S. Statton ; Kapinnie—Clem Harris ; Hope Forest—L. Bevan ; Pinnaroo Women's—Miss D. Brymer ; Coonawarra—E. L. Gaffney ; Koonunga—H. Faulkenburg, R. L. Schulz, A. Mickan ; Wolseley—Jas. Durbridge, Chas. Matthews ; Coonawarra—J. M. Kain.

No. of members, 8,268 ; No. of Branches, 322.

Items relating to irrigation experiments, &c., were taken in committee.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co., Limited, reported on February 1st, 1933—

Butter.—The local demand for Factory Butter throughout January showed considerable improvement because of the decrease in manufacture of Dairy and Store Butters. The production of all grades however showed a steady decline which is usual at this time of the year, with the feed drying off and consequent lessened flow of milk. Although there is still a surplus of lower grade Factory Butter which is being packed each week for shipment overseas the supplies of Choicest are barely sufficient for local needs, and consequently supplies have had to be augmented by importations from Victoria during the past few weeks. Values in London again touched record low levels and it seems difficult to forecast the likely movements of trade there. Local values have continued fairly steady, but the market is somewhat weak because of the overseas position.

Choicest Creamery fresh butter in bulk 1s. 0¼d. Prints and delivery extra. (These prices are subject to the Stabilization Levies). Store and Collectors 6½d. to 7d. per lb. at store door, less usual selling charges.

Eggs.—The usual season contraction in supplies continues, but with exporting now ceased, there has been more than sufficient quantities available for all local requirements. Consequently the surplus of better grade Infertile Eggs has found an outlet in the Eastern States, and Pulp Manufacturers have also taken large quantities of farm eggs for Winter use. Values tend firmer for all grades.

Ordinary country eggs, hen or duck, 5d. per dozen. Selected, tested and infertile higher, according to quality.

Cheese.—The quantities manufactured in this State this year have easily constituted a record, and a heavy tonnage was exported to Britain. With the declining milk supplies, however, exporting has now about ceased, but the local and interstate demand is now about equal to supply. Rates are steady.

New makes, large to loaf 6½d. to 7d. Semi-matured and matured 9d. to 11d. per lb.

Bacon.—The supplies of bacon of all cuts have kept up well throughout January, as heavy quantities of live hogs were available at the Abattoirs and country markets each week, and therefore stocks of bacon in process of curing were kept at high levels. The turnover of the finished article was well maintained, and this was helped because of the fairly cool weather which was experienced last month. Prices showed an easing which also stimulated sales.

Best local sides 7¾d. to 8d. Best local factory cured middles 7d. to 7½d. Large 6½d. Loca rolls 7d. to 7½d. Local hams 11d. to 11½d. per lb. Cooked 1s. 0½d. to 1s. 1d. Lard, prints 5d. per lb.

Almonds.—Limited supplies of New Season's are now being marketed, and because of the loss in weight which occurs in the drying out, buyers limits were reduced and values in the open market therefore came back ½d. per lb. Kernels however, continue to sell steadily without alteration.

Brandis and Softshells 8½d. to 9d. Hardshells 5d. to 5½d. per lb. Kernels 2s. 2d. to 2s. 3d. per lb.

Honey.—There is little improvement to report in the demand for honey, and although the quality of the new season's "Take" is satisfactory, demand is not likely to improve until the cooler weather sets in.

Prime clear extracted in liquid condition 2¾d. to 3¼d. Lower grades 1½d. to 2d. per lb.

Beeswax.—Is now short in supply and meeting with good demand.

1s. to 1s. 0½d. per lb., according to sample.

Live Poultry.—The supplies of live poultry throughout the month were larger than usual as many breeders were quitting old season's stock. Prices maintained fairly well but more particularly for prime quality table birds. We advise consigning. Crates loaned on application.

Live Poultry.—Prime roosters 3s. 3d. to 4s. 8d. Nice conditioned cockerels 2s. 8d. to 3s. 1d. Fair conditioned cockerels 2s. to 2s. 7d. Chickens lower. Heavy weight hens 2s. 3d. to 3s. 6d. Medium hens 1s. 9d. to 2s. 2d. Light hens 1s. 2d. to 1s. 7d. Couple of pens of weedy sorts lower. Geese 3s. 6d. to 4s. 6d. Goslings lower. Prime young Muscovy Drakes, 4s. to 5s. Young Muscovy Ducks 2s. 3d. to 3s. Ordinary ducks 1s. 2d. to 2s. 6d. Ducklings lower. Turkeys good to prime condition 11d. to 1s. 4d. per lb. live weight. Turkeys fair condition 8d. to 9d. per lb. live weight. Turkeys fattening sorts lower. Pigeons 3d. to 4d. each.

Potatoes.—Local new 4s. 6d. per cwt.

Onions.—New season's 5s. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of January, 1933, also the average precipitation for the month of January and the average annual rainfall.

Station.	For Jan., 1933.	Av'ge for Jan.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.			
Oodnadatta	0·05	0·58	4·70
Marree	—	0·41	5·89
Farina	—	0·50	6·47
Copley	0·10	0·55	7·94
Beltana	0·16	0·66	8·54
Blinman	0·39	0·91	11·95
Hookina	—	0·49	11·53
Hawker	0·04	0·58	12·30
Wilson	—	0·60	11·78
Gordon	—	0·62	10·63
Quorn	0·62	0·64	13·29
Port Augusta	0·32	0·52	9·42
Bruce	—	0·45	9·93
Hammond	0·04	0·60	11·31
Wilmington	0·43	0·80	17·43
Willowie	0·34	0·47	12·19
Melrose	0·89	1·15	22·85
Booleroo Centre	1·92	0·74	15·15
Port Germein	0·84	0·61	12·43
Wirrabara	2·86	0·66	19·21
Appila	0·76	0·62	14·57
Cradock	0·99	0·58	10·83
Carrieton	0·12	0·75	12·31
Johnburg	0·12	0·58	10·61
Eurelia	—	0·76	12·87
Orroroo	0·29	0·96	13·21
Nackara	1·26	0·66	11·16
Black Rock	0·08	0·69	12·41
Oodlawirra	2·14	0·49	11·56
Peterborough	0·16	0·81	13·21
Yongala	0·38	0·65	14·42
NORTH-EAST.			
Yunta	0·63	0·60	8·50
Waukaringa	0·08	0·49	8·00
Mannahill	0·16	0·63	8·28
Cockburn	0·17	0·60	7·96
Broken Hill	0·07	0·67	9·63
LOWER NORTH.			
Port Pirie	0·32	0·60	13·17
Port Broughton	0·12	0·58	13·93
Bute	0·17	0·56	15·36
Laura	1·18	0·69	17·91
Caltowie	0·72	0·68	16·69
Jamestown	0·50	0·67	17·71
Gladstone	0·78	0·65	16·29
Crystal Brook	1·25	0·64	15·78
Georgetown	1·21	0·66	18·35
Narridy	0·17	0·54	15·85
Redhill	0·42	0·56	16·55
Spalding	0·95	0·59	18·99
Gulnare	0·93	0·63	18·56
Yacka	0·61	0·49	15·33
Koolunga	0·35	0·59	15·40
Snowtown	0·45	0·58	15·64
LOWER NORTH—*continued.*			
Brinkworth	0·73	0·50	15·74
Blyth	1·17	0·65	16·77
Clare	1·90	0·85	24·53
Mintaro	1·77	0·60	23·42
Watervale	0·76	0·89	26·91
Auburn	0·62	0·96	23·98
Hoyleton	1·32	0·71	17·32
Balaklava	0·85	0·67	15·49
Pt. Wakefield	0·45	0·55	12·93
Terowie	0·91	0·69	13·35
Yarcowie	1·28	0·67	13·57
Hallett	1·09	0·68	16·40
Mount Bryan	1·76	0·54	16·65
Kooringa	0·33	0·72	17·89
Farrell's Flat	0·39	0·72	18·65
WEST OF MURRAY RANGE.			
Manoora	1·75	0·58	18·83
Saddleworth	1·14	0·73	19·55
Marrabel	2·30	0·70	19·84
Riverton	0·91	0·74	20·75
Tarlee	1·18	0·74	18·11
Stockport	1·10	0·72	16·88
Hamley Bridge	1·05	0·75	16·54
Kapunda	2·91	0·81	19·79
Freeling	1·94	0·71	17·85
Greenock	2·12	0·75	21·56
Truro	1·38	0·70	19·96
Stockwell	2·15	0·67	20·12
Nuriootpa	2·69	0·74	20·64
Angaston	1·98	0·76	22·43
Tanunda	2·88	0·81	22·02
Lyndoch	2·28	0·72	23·45
Williamstown	4·14	0·86	27·71
ADELAIDE PLAINS.			
Owen	1·17	0·37	14·33
Mallala	1·01	0·69	16·56
Roseworthy	1·36	0·69	17·34
Gawler	1·19	0·71	18·96
Two Wells	0·89	0·63	15·70
Virginia	0·94	0·67	17·12
Smithfield	1·03	0·51	17·50
Salisbury	1·57	0·69	18·54
Adelaide	2·25	0·70	21·10
Glen Osmond	1·41	0·90	25·96
Magill	1·47	0·83	25·50
MOUNT LOFTY RANGES.			
Teatree Gully	1·54	0·81	27·30
Stirling West	2·04	1·51	46·91
Uraidla	2·40	1·31	43·91
Clarendon	1·96	1·07	32·82
Morphett Vale	1·29	0·74	22·64
Noarlunga	1·10	0·58	20·34
Willunga	1·69	0·76	26·01
Aldinga	1·21	0·55	20·21

RAINFALL—*continued.*

Station.	For Jan., 1933.	Av'ge for Jan.	Av'ge Annual Rain-fall.
MOUNT LOFTY RANGES—*contd.*			
Myponga	1·28	0·69	29·48
Normanville	1·80	0·55	20·69
Yankalilla	2·02	0·54	22·85
Mount Pleasant	4·31	0·82	27·18
Birdwood	2·58	0·99	29·15
Gumeracha	3·44	1·05	33·39
Millbrook Res.	3·68	1·03	34·86
Tweedvale	3·67	0·98	35·89
Woodside	2·97	0·96	32·25
Ambleside	1·65	1·07	34·87
Nairne	3·38	0·93	28·09
Mount Barker	3·48	1·02	31·79
Echunga	2·54	1·04	33·15
Macclesfield	1·86	0·89	30·43
Meadows	1·91	1·03	36·12
Strathalbyn	1·24	0·69	19·34
MURRAY FLATS AND VALLEY.			
Meningie	0·96	0·61	18·37
Milang	0·59	0·60	14·92
Langhorne's Ck.	0·90	0·46	14·76
Wellington	1·64	0·70	14·56
TaiJem Bend	2·20	0·48	14·70
Murray Bridge	1·07	0·55	13·59
Callington	1·47	0·66	15·20
Mannum	0·92	0·49	11·47
Palmer	5·21	0·43	15·43
Sedan	2·63	0·54	12·11
Swan Reach	3·39	0·36	10·60
Blanchetown	2·25	0·64	11·04
Eudunda	1·68	0·66	17·11
Sutherlands	1·84	0·34	10·82
Morgan	0·51	0·49	9·20
Waikerie	1·43	0·33	9·66
Overland Crnr.	2·07	0·46	10·41
Loxton	1·86	0·46	11·59
Renmark	1·21	0·45	10·49
WEST OF SPENCER'S GULF.			
Eucla	0·24	0·59	9·98
Nullarbor	0·08	0·37	8·73
Fowler's Bay	0·19	0·37	11·82
Penong	0·22	0·30	12·12
Koonibba	0·38	0·29	11·82
Denial Bay	0·07	0·24	11·36
Ceduna	0·26	0·22	9·95
Smoky Bay	0·56	0·24	10·28
Wirrulla	0·51	0·12	10·08
Streaky Bay	0·22	0·40	14·82
Chandada	0·90	—	—
Minnipa	0·45	0·58	13·68
Kyancutta	0·46	—	—
Talia	0·10	0·26	14·63
Port Elliston	0·16	0·37	16·39
Yeelanna	—	0·23	15·72
Cummins	0·19	0·37	17·35
Port Lincoln	1·90	0·54	19·34
Tumby	0·71	0·28	13·92
Ungarra	0·72	0·30	16·73
Carrow	0·27	0·32	13·08
Arno Bay	0·42	0·38	12·44

Station.	For Jan., 1932.	Av'ge for Jan.	Av'ge Annual Rain-fall.
WEST OF SPENCER'S—*contd.*			
Rudall	0·48	0·51	12·19
Cleve	0·38	0·51	14·66
Cowell	0·58	0·45	11·10
Miltalie	0·73	0·51	13·54
Darke's Peak	0·51	0·55	14·92
Kimba	0·37	0·31	11·52
YORKE PENINSULA.			
Wallaroo	0·54	0·52	13·91
Kadina	0·43	0·50	15·61
Moonta	0·47	0·49	15·05
Paskeville	0·11	0·47	15·46
Maitland	0·89	0·60	19·90
Ardrossan	0·46	0·48	13·93
Port Victoria	0·45	0·45	15·40
Curramulka	0·18	0·56	17·87
Minlaton	0·50	0·50	17·80
Port Vincent	0·23	0·39	14·40
Brentwood	0·52	0·34	15·45
Stansbury	0·50	0·55	16·81
Warooka	0·28	0·43	17·51
Yorketown	0·33	0·46	16·94
Edithburgh	0·69	0·48	16·34
SOUTH AND SOUTH-EAST.			
Cape Borda	0·95	0·59	24·83
Kingscote	1·04	0·44	19·11
Penneshaw	0·92	0·41	18·85
Victor Harbor	1·12	0·67	21·27
Port Elliot	0·96	0·64	19·91
Goolwa	0·96	0·64	17·81
Copeville	2·14	0·35	11·44
Meribah	1·50	0·52	11·10
Alawoona	1·65	0·45	10·02
Mindarie	1·94	0·48	11·91
Sandalwood	2·81	0·52	13·57
Karoonda	0·73	0·48	14·33
Pinnaroo	1·23	0·41	14·54
Parilla	0·30	0·44	13·90
Lameroo	0·90	0·54	16·08
Parrakie	0·66	0·43	14·49
Geranium	0·71	0·45	16·41
Peake	1·63	0·53	16·03
Cooke's Plains	0·94	0·52	15·38
Coomandook	0·93	0·48	17·11
Coonalpyn	5·73	0·64	17·42
Tintinara	0·83	0·48	18·60
Keith	0·85	0·42	17·87
Bordertown	1·55	0·70	19·22
Wolseley	1·06	0·58	18·41
Frances	0·97	0·67	19·99
Naracoorte	0·78	0·79	22·59
Penola	0·72	1·03	26·06
Lucindale	0·86	0·70	23·16
Kingston	1·25	0·72	24·33
Robe	0·46	0·78	24·64
Beachport	0·35	0·85	26·93
Millicent	0·59	0·96	29·76
Kalangadoo	1·66	1·18	32·03
Mount Gambier	1·16	1·34	30·52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Feb.	Mar.
Adelaide	†	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	*	10	10
Alma	*	—	—
Amyton	*	—	—
Angaston	*	—	—
Appila	*	—	—
Appila Yarrowie	*	—	—
Arthurton	*	—	—
Ashbourne	*	8	8
Auburn Women's	832	—	31
Balaklava	*	27	27
Balhannah	*	—	—
Balumbah	850	—	—
Balumbah Women's	*	1	1
Barmera	*	—	—
Beetaloo Valley	*	6	6
Belalie Women's	833	R	14
Belvidere	*	—	—
Berri	*	13	14
Big Swamp	*	—	—
Blackheath	†	16	16
Black Rock	*	—	—
Black Springs	*	—	—
Blackwood	858	8	R
Block E	*	—	—
Blyth	*	24	24
Booleroo Centre	*	10	10
Boolgun	*	—	—
Boor's Plains	*	3	—
Borrika	*	—	—
Bowhill	*	6	6
Brentwood	850	2	2
Brinkley	*	8	8
Brinkworth	844	6	6
Brownlow	*	—	—
Buchanan	*	—	—
Bugle	*	14	14
Bundaleer Springs	*	—	—
Bute	*	16	16
Butler	*	—	—
Calca	*	—	—
Cadell	*	—	—
Caliph	*	7	7
Caltowie	*	—	—
Canowie Belt	*	—	—
Caralue	*	8	8
Carrow	*	8	8
Chandada	*	—	—
Charra	*	—	—
Cherry Gardens	858	—	—
Clanfield	*	—	—
Clare Women's	†	—	—
Clarendon	*	6	6
Cleve	*	4	11
Cobdogla	*	—	—
Collie	*	1	1
Colton	*	—	—
Coomandook	*	23	23
Coonalpyn	*	—	—
Coonawarra	840	9	9
Coonawarra Women's	833	R	15
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	—	—
Cummins	*	10	10
Cungena	*	2	2
Currency Creek	*	13	13
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	—	—
Elbow Hill	851	7	7
Eudunda	*	6	6
Eurelia	*	11	11
Eurelia Women's	*	1	1
Everard East	*	—	—

Branch.	Report on Page.	Dates of Meetings.	
		Feb.	Mar.
Farrell's Flat	*	24	24
Finniss	*	—	—
Frances	840	1	1
Frayville	*	—	—
Gawler River	*	—	—
Georgetown	*	4	11
Geranium	*	25	25
Gladstone	*	10	15
Gladstone Women's	834	10	10
Glencoe	*	14	14
Glossop	*	—	—
Goode	†	9	9
Goode Women's	*	9	—
Greenock	845	13	13
Green Patch	853	9	9
Gulnare	*	—	—
Gumeracha	*	13	13
Halidon	*	—	—
Hanson	*	7	7
Hartley	859	8	8
Hawker	*	—	—
Hindmarsh Island	*	—	—
Hookina	*	—	—
Hope Forest	*	6	6
Hoyleton	*	20	20
Inman Valley	*	16	16
Ironbank	*	—	—
Jamestown	*	15	15
Jervois	†	9	9
Kalangadoo Women's	*	11	11
Kalangadoo	*	11	11
Kalyan	*	15	15
Kangarilla	*	—	—
Kangarilla Women's	*	16	16
Kanmantoo	*	—	—
Kanni	*	—	—
Kapinnie	853	R	—
Kapunda	*	10	10
Kareultaby	*	—	—
Karoonda	*	8	15
Keith	*	9	9
Kelly	*	4	11
Ki Ki	*	—	—
Kilkerran	*	9	9
Kongorong	*	6	6
Koolunga	843	—	—
Koonibba	*	9	9
Koonunga	844	—	—
Koppio	*	7	7
Kringin	*	13	13
Kulkawirra	856	14	14
Kyancutta	*	7	7
Kybybolite	*	9	9
Kybybolite Women's	*	7	7
Lameroo	*	4	11
Langhorne's Creek	860	8	8
Laura	854	11	11
Laura Bay	*	14	14
Lenswood & Forest Range	*	—	—
Light's Pass	846	—	—
Lipson	*	4	11
Lone Gum and Monash	*	8	8
Lone Pine	†	6	6
Longwood	*	—	—
Lowbank	*	8	8
Loxton	*	10	10
Lucindale	*	—	—
Lyndoch	*	7	7
McLaren Flat	*	—	—
McLaren Flat Women's	834	2	2
Macclesfield	*	16	16
MacGillivray	*	7	7
Mallala	*	20	20
Maltee	*	9	9
Mangalo	*	—	—
Mangalo Women's	*	—	—
Mannanarie	*	—	—
Marama	*	—	—
Meadows	*	8	8

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Branch.	Report on Page.	Dates of Meetings.		Branch.	Report on Page.	Dates of Meetings.	
		Feb.	Mar.			Feb	Mar.
Meribah	*	R	13	Rosy Pine	*	—	—
Milang	860	8	8	Rudall	*	7	7
Millendilla	*	—	—	Saddleworth	*	10	10
Millicent	*	24	24	Saddleworth Women's	*	7	7
Millicent Women's	836	R	—	Salisbury	*	—	—
Miltalie	*	4	11	Salt Creek	*	—	—
Mindarie	*	3	3	Sandalwood	*	—	—
Minnipa	*	—	—	Scott's Bottom	†	4	11
Modbury	*	—	—	Shoal Bay	†	7	7
Monarto South	*	—	—	Smoky Bay	*	—	—
Moonta	*	—	—	Snowtown	*	10	10
Moorlands	*	8	—	South Kilkerran	*	7	7
Moorook	*	—	—	Spalding	*	—	—
Morchard	*	10	10	Springton	861	1	1
Morphett Vale	*	—	—	Stanley Flat	*	20	20
Mount Barker	*	20	20	Stirling	*	—	—
Mount Bryan	*	—	—	Stockport	*	—	—
Mount Compass	†	2	2	Strathalbyn	*	8	8
Mount Gambier	841	10	—	Streaky Bay	*	24	24
Mount Hope	*	7	7	Tailem Bend	*	16	16
Mount Pleasant	*	—	—	Talia	*	24	31
Mount Remarkable	*	—	—	Tantanoola	*	4	4
Mount Schank	*	—	—	Tantanoola Women's	839	1	1
Mudamuckla	*	11	11	Taplan	*	R	7
Mundalla	†	—	—	Taragoro	854	9	8
Mundalla Women's	837	9	9	Tarcowie	*	—	—
Murray Bridge	*	—	—	Tarlee	*	—	—
Murraytown	*	—	—	Tarpeena	*	—	—
Mypolonga	*	—	—	Tatiara	*	—	—
Myponga	861	16	16	Thrington	*	—	—
Myrla	*	8	8	Tintinara	*	—	—
Nantawarra	*	9	9	Truro	846	20	20
Naracoorte	*	11	11	Tulkineara	*	9	9
Narridy	*	—	—	Tweedvale	*	16	16
Narrung	*	—	—	Two Wells	*	—	—
Nelshaby	*	—	—	Ungarra	*	16	16
Nelshaby Women's	*	—	—	Upper Wakefield	*	—	—
Netherton	*	8	8	Uraidla and Summertown	*	6	6
New Residence	*	—	—	Veitch	*	—	—
North Booborowie	*	—	—	Virginia	*	—	—
Nunjikompita	*	9	9	Waddikee Rocks	*	4	11
Nunkeri	*	8	8	Walkerie	*	10	10
O'Loughlin	*	13	13	Wallala	855	8	8
Orroroo	*	—	—	Wanbi	*	22	22
Overland Corner	*	8	8	Wandearah	*	7	7
Owen	*	10	10	Warcowie	*	R	7
Palabie	*	—	—	Warcowie Women's	*	R	7
Parilla	*	R	7	Warramboo	*	7	7
Parilla Women's	*	15	15	Warramboo Women's	*	3	—
Parilla Well	*	13	13	Wasleys	*	9	9
Parilla Well Women's	*	28	28	Wasleys Women's	*	2	2
Parrakie	*	—	—	Watervale	847	20	20
Parrakie Women's	*	28	28	Wauraltee	*	7	7
Paruna	*	R	3	Weavers	*	13	13
Paskeville	*	7	7	Wepowie	*	6	6
Pata	*	3	3	Whyte-Yarcowie	*	—	—
Penneshaw	*	—	—	White's River	*	—	—
Penola	*	—	4	Wilkawatt Women's	*	—	—
Penola Women's	837	4	—	Williamstown Women's	*	1	1
Penwortham	*	9	9	Williamstown	*	—	—
Petersville	*	7	7	Willowie	*	27	27
Petina	*	25	25	Wilmington	843	14	14
Pinbong	*	—	—	Windsor	*	—	—
Pinkawillinie	*	—	—	Wirrabara	*	—	—
Pinnaroo	*	—	—	Wirrilla	*	9	9
Pinnaroo Women's	838	2	3	Wirrilla Women's	*	2	2
Port Elliott	*	18	18	Wirrulla	*	15	15
Pygery	*	7	7	Wolseley	*	13	13
Pygery Women's	*	—	—	Wudinna	*	—	—
Quorn	*	6	6	Wynarka	*	—	—
Ramco	857	—	—	Yacka	*	—	—
Rapid Bay	*	—	—	Yadnarie	*	7	7
Redhill	*	9	11	Yallunda Flat	*	—	—
Rendelsham	841	—	—	Yandiah	*	10	7
Renmark	*	—	—	Yaninee	*	—	—
Rhynie	*	9	—	Yantanabie	*	—	—
Richman's Creek	*	13	13	Yeelanna	*	8	8
Riverton	*	—	—	Yorketown	*	—	—
Riverton Women's	*	—	—	Younghusband	*	—	—
Roberts and Verran	854	—	—	Yurgo	*	R	—
Rosedale	*	—	—	Yurgo Women's	*	—	—
Roseworthy	*						

*** No report received during the month of December. † Held over. R In recess.**

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

WOMEN'S BRANCHES.

HORTICULTURAL INQUIRIES.

[*Replies supplied by G. Quinn, Chief Horticultural Instructor.*]

Pruning Tomato Plants.

Clare Women's Branch asks: "What is the correct method of pruning tomatoes, and the best manure to use."

Reply—Tomatoes are usually trained to one or two leading shoots, and all laterals arising in the axils of the leaves on these leaders are cut or pinched out when an inch or so in length. The tips of the leaders, if necessary, are pinched back when 2ft. or more high. Farmyard manure is dug in when preparing the land for planting. A sprinkling of bonedust or superphosphate, also sulphate of potash, may be worked into the land. When the plants have matured about half of the crop a sprinkling of sulphate of ammonia or nitrate of soda dissolved into the ground with a good watering will help to continue the cropping.

Cutting Back Geraniums.

The Clare Women's Branch also asked: "What is the best time to cut back geraniums."

Reply—Geraniums, or more correctly pelargoniums, are usually cut back in January or February, and if watered will make new growth and bloom in the autumn, and if not too frosty in the locality, well on into the winter. They may be cut back in December after the first blooming is over and will, if watered and manured, make good growth and flower again in late summer, but as a rule the main cutting back is that which is outlined above.

AUBURN (Average annual rainfall, 23.98in.).

November 25th.—Present: 18 members.

CHRISTMAS RECIPES.—An interesting collection of novelties was tabled by Miss B. Dennison suitable for Christmas presents, which could be made at quite a small cost. Miss Dennison also gave the following recipes:—*Christmas Cake*: 1½lbs. flour, 3lbs. currants, 1lb. raisins, ½lb. almonds, 1½lbs. butter, 1½lbs. sugar, ½lb. lemon peel, 15 eggs. 1 teaspoon mixed spice, brandy to taste if desired; mix altogether and bake 3 hours; if divided into 3 tins bake 1½ hours. *Christmas Pudding*: 1½lbs. raisins, ½lb. currants, ½lb. mixed peel, ¾lb. bread crumbs, ¾lb. suet, 8 eggs, 1 teaspoon mixed spice, 1 wineglass brandy; when all the dry ingredients are well mixed moisten with beaten eggs and brandy; stir well; boil 6 hours first day; when wanted boil about 2 hours; serve with brandy sauce. *Brandy Sauce*: 1 tablespoon corn flour, 2 tablespoons sugar; moisten with milk then add enough boiling water to thicken; flavor with brandy and nutmeg. *Apricot Biscuits*: 3ozs. butter, 3ozs. sugar, 1 egg, 6ozs. flour, 1 teaspoon apricot jam, 1 tablespoon cream; mix ingredients well, then drop small lots on oven tray; put in a hot oven for 5 minutes. *Spanish Cream*: 1 pint of milk, ½oz. gelatine, 1 tablespoon sugar, 3 eggs; put milk and gelatine on fire, stir occasionally, when dissolved add yolks of eggs and sugar, and stir until it boils; when half cold add whipped whites and a few drops of vanilla essence. (Secretary, Miss L. Dennison.)

BELALIE (Average annual rainfall, 17.71in.).

Thirteen members of the Branch attended the meeting held on December 13th. Instructive papers, ''Plants and Flowers'' and ''The Teeth in Relation to Health,'' were read by Miss Mitchell and Mrs. M. Baily and the Secretary, Mrs. A. Cummings.

COONAWARRA.

November 16th.—Present: 20 members.

Jam Making and Preserving.—Mrs. J. Skinner read the following paper:—''Everything connected with fruit preserving should be scrupulously clean, and wooden spoons should be used. To preserve in any form, fruit should be perfectly sound and not over-ripe. The proportion of sugar in making jam is 1lb. sugar to 1lb. fruit, except in fig and melon, to which allow ¾lb. For jelly, 1 cup of sugar to 1 cup of juice. Jam must be bottled hot. If left uncovered, minute organisms will cause mould to grow or excite fermentation. Large crystal sugar is best. *Orange and Melon Jam*: 6 large oranges, 6 lemons, 5qts. water, 12lbs. sugar. Pare the fruit as thinly as possible; put in the pan with water; let stand all night. Boil for 1 hour before adding sugar, then boil until it jellies.'' *Preserving without ''Fowler's Outfit''*.—First method: For a sterilizing vat the copper or a kerosene tin cut lengthways is suitable, with a platform made to fit each one. The platform can be easily made from wood. Prepare the fruit, pack in jars, and add about 1 tablespoon of cold syrup to each jar, except in cases of fruits which discolor, such as pears, quinces, peaches, and apples; these should be covered with cold syrup before cooking. Place lids loosely on jars. Stand each jar on platform in sterilizer with the water reaching just below the surface of platform. Cover copper and bring water slowly to boiling point. When cooked fill each jar to over-flowing with boiling syrup (4ozs. to 6ozs. sugar to 1 pint water boiled from 8 to 10 minutes). Screw down lids and remove from copper. Second method: Prepare fruit and pack in jars. Fill each with cold syrup and screw on lids. Place jars in copper containing cold water reaching to shoulder of jar. Pack paper, straw or cloths around jars to prevent them bumping when water boils. Bring to boil and continue until fruit cooked. All bottles and jars used in preserving must be absolutely airtight. *Mulberry and Apricot Jam*: 15lbs. mulberries (minced), 9lbs. apricots (stoned), ¾lb. sugar to each pound fruit. Bring fruit to the boil, add sugar and boil from 1½ to 2 hours.

Preserving Fruits.—Paper by Mrs. A. Reschke:—''It is a great asset to have a good supply of preserved fruits on hand in the home for winter and early spring when fresh fruits are not available; and to have this supply on hand it is necessary to preserve each kind of fruit as it ripens. Fowler's preserving outfit is the best. If mason jars are used fill up tightly with fruit with the aid of the packing stick. Add water or syrup; put on the rubber ring, which has been scalded first in boiling water, then the lid, which has been scalded also, and screw down tightly with the proper jar wrench. Put into the sterilizer and sterilize as directed for each fruit. When taken out of the sterilizer screw down again as tightly as possible. The lids of the mason jars often seem to be a little loose after sterilizing, and if not screwed down very tightly before putting into the sterilizer the juice escapes for an inch or so down, and the top of the fruit is not covered. In selecting fruit for preserving choose at the exact ripeness if possible—ripe enough to have the nice flavor of each fruit, and not too green or over-ripe. Fruit over-ripe will never be a great success. It is likely to squash when filling the jars, and rises very quickly in the bottles. Always fill the jars tightly with fruit; this also helps to keep it from rising in the jars. Cherries and gooseberries are about the first fruits to ripen; they preserve well. Apricots come early in the new year and are one of the best fruits to preserve; Moorparks being the best variety to use. Cut the apricots in halves and take out the stone and pack well in layers—one piece over the other—with the cut side downwards. Fill up the bottles that way; put in the syrup, and fill to the top. Put on the rubber ring, which has been previously scalded; then lid, also scalded, and press lid down. See that the rubber ring does not bulge below the lid; put on clip and place in the sterilizer. Continue until the sterilizer is full. Then put the water in the sterilizer until it is three quarters of the way up the bottles. Put sterilizer on the stove and bring the temperature up to 160 degrees and maintain as near as possible for 1½ hours. I preserve many bottles of mulberries each year and find them a great standby during winter to use with apples as conserve, or for pies. Fill the jars as full as possible, crushing the mulberries down, and preserve them in their own juice without either water or sugar. They have the tree mulberry flavor when opened and the sugar can be added as they are mixed with the apple. They can also be preserved with sliced apple or quince. They require exactly the same temperature as apricots, slowly bringing up to 160 degrees and maintaining as near as possible for 2½ hours, instead of 1½, for apricots. Nectarines can be packed exactly the same as apricots, and bring slowly up to 180 degrees in temperature and maintain as near as possible for half an hour only. Nectarines are very sensitive to heat, and rise in the bottles if the temperature comes up too quickly. Pears are one of the best fruits to preserve, and are easily done, but the temperature is higher than most fruits, being 200 degrees, allowing to drop to 180 degrees, and maintaining at that for 2½ hours. Prunes and plums of all kinds preserve well, are easily done, make a nice collection in the pantry, and are very useful in the home. Tomatoes are easily preserved and are a great success, either whole or pulped. I peel and pulp them and do not use either water or salt, only in their own juice, and they make delicious tomato soup in winter. Mushrooms. Peel and clean the mushrooms while quite fresh and place in a saucepan with a little butter, pepper, and salt, and boil very slowly to cook them in their own juice instead of adding water. When cooked, allow to cool off, and then place them in bottles and preserve as directed in Fowler's book. They must be sterilized twice, or they are likely to ferment. They can then be used at any time of the year, and make a delightful breakfast dish if heated and placed on toast.'' (Secretary, Mrs. F. Skinner.)

GLADSTONE (Average annual rainfall, 16.29in.).

December 9th.—Present: 24 members.

Miss M. Sargent won first prize for the Christmas Cake Competition, second place being awarded to Mrs. G. Smallacombe.

BISCUIT RECIPES.—*Biscuit Mixture* (Mrs. E. A. Gale): ½ cup sugar, ½lb. butter, ½ cup chopped almonds, ¾ cup dates, 1 egg, 1 tablespoon boiling water, 1¾ cups flour; beat sugar and butter to a cream, add eggs and fruit, flour, lastly ½ teaspoon soda in water; bake in moderate oven; put 1 teaspoon on slide. *Lemon Biscuit*: 1lb. flour, ½lb. butter, ½lb. sugar, 2 eggs, essence, 1 teaspoon soda, 2 teaspoons carb. soda; beat ½lb. butter, ½lb. sugar, 2 eggs, essence, 1 teaspoon soda, 2 teaspoons cream tartar; beat mix well, roll out thin and cut into shapes. *Ginger Biscuit*: 1lb. dark sugar, 1lb. flour, ½ teaspoon cream tartar, ¼ teaspoon carb. soda, 2 egg-cups ginger, 2 eggs, 1 teaspoon treacle, ¼lb .butter, 1 teaspoon mixed spice; mix with milk; drop 1 teaspoon on slide. *Spearwood Biscuits*: 10ozs. plain flour, ½lb. butter, 2oz. castor sugar, few carraway seeds; while warm sprinkle icing sugar on top; bake 10 minutes. *Munches* (Mrs. R. E. Lines): 2 cups flaked oats, ¾ cup plain flour, 1 cup sugar, 1 cup coconut, 6ozs. butter, ½ teaspoon carb. soda in 3 tablespoons boiling water, 2 dessertspoons treacle; melt butter and treacle, add soda and hot water, then mix in other ingredients; warm oven, put 1 teaspoon on slide. *Ginger Biscuits*: 3 cups plain flour, 1 cup sugar, 1 cup treacle, 1 cup butter, 2 teaspoons ginger, 1 teaspoon cinnamon, 1 teaspoon carb. soda dissolved in hot water; mix sugar and butter into flour and add other ingredients; roll out thinly and bake in moderate oven. *Date Biscuits*: 3 cups S.R. flour, 1 cup sugar, 3 eggs, 3 tablespoons butter; beat sugar and butter, add eggs, then flour; roll out and put dates between. *Biscuit Mixture*: 5 eggs, 1 cup butter, 1 cup sugar, enough S.R. flour to make into stiff mixture, essence lemon; beat butter and sugar together, add eggs and flour. *Melting Moments*: Melt 8ozs. butter, allow to cool off; mix into this 2ozs. icing sugar, 2 ozs. corn flour, and 7 tablespoons plain flour; put into a cutter and force through. *Ginger Cookies* (Mrs. G. Smallacombe): 1 cup treacle, ½ cup butter or dripping, ½ cup sugar, ¼ cup cream or milk, 1 teaspoon ground ginger, 1 egg, 1½ teaspoons carb. soda; flour enough to roll out thick; moderate oven. *Brandy Snaps*: Put into saucepan ¾lb. treacle, 6ozs. butter, leave on stove till butter melts, stir in ½lb. brown sugar, 1 teaspoon ground ginger and essence, ½lb. S.R. flour, and drop 1 teaspoon on greased slide. *Feather Biscuits*: Beat ½lb. butter and 1 cup sugar to a cream. add 2 eggs, and lastly, 2½ cups S.R. flour; roll out thin and cut into shapes; place ½ date in centre. *Arrowroot Biscuits*: Cream ½lb. butter or dripping with ½lb. sugar, essence, add 2 eggs and ½ cup milk; mix together ¼lb. corn flour and ¾lb. plain flour and 1 teaspoon baking powder; mix fairly stiff, roll out thin and bake in hot oven. *Rosala Biscuits*: 2 cups S.R. flour, ½ cup sugar, ¼lb. butter, 1 egg; mix dry ingredients together and make into stiff paste with yolk of egg and a little milk; roll out thin; beat white of egg to stiff froth and add sufficient icing sugar to make it stiff, and spread on dough; sprinkle with cocoanut and cut into shapes. (Secretary, Miss M. Sargent.)

McLAREN FLAT.

December 1st.—Present: 22 members.

SWEET-MAKING.—Mrs. T. Blythman read the following paper:—''Making sweets needs very careful attention. Care must be taken with the stove. See that you have a good, even heat. A gas stove is preferable to any other, giving the same heat all the time, or more or less, as required. Too much heat will scorch the syrup before the required degree is registered. In this case, a thermometer is most necessary. The whole secret of sweet-making is in the proper use of a thermometer. When ready for use, the thermometer is slightly warmed near the fire or put into warm water. Then place the thermometer in the saucepan of boiling syrup and allow it to lean against the side until the proper degree of boiling has been registered. It is then removed and washed in hot water and hung up to dry. Never wash the thermometer in cold water. In making sweets, always use the best quality sugar. If the sugar is too coarse it takes longer to boil and may spoil the sweets. Do not allow the syrup to boil until all the sugar is perfectly dissolved. Never stir the syrup after it starts to boil, but have a clean brush dipped in cold water and keep the syrup brushed down the side of the saucepan, taking care not to let the brush touch the syrup. When the syrup starts to boil, it must be kept boiling quickly. Boiling too slowly causes granulation. Never stir the boiling syrup, only when specially directed to do so. As soon as the correct degree is reached, remove the saucepan from the fire. Always watch the thermometer, never allowing it to go over the given degree. Care must be taken in using coloring and flavoring; see that they match. In matching colors and flavorings a rose flavor is necessary for a pale pink color, lemon flavor a canary color, vanilla flavor, chocolate color, &c. Flavorings should be very delicately done and colorings very dainty. Always remember the color is deeper when the sweets are cold. Light shades look much better than bright ones. The most important ingredient in sweet-making is sugar, and there is also a good quantity of maize syrup used, but this is rather difficult to obtain and is also expensive. Cream of tartar is used as a substitute. One teaspoonful of cream of tartar is equal to 12 ozs of maize syrup. Often sweets made with cream of tartar will become granulated or sugary; if the syrup is used this may not occur. In using maize syrup—always when weighing out—weigh the sugar first and then weigh the syrup on top of the sugar, this prevents it sticking to the scales; and always use a spoon dipped in cold water to remove the syrup from the tin. Return the spoon to the water. In making toffee put 3lbs. of sugar, ¾lb. maize syrup into saucepan, cover with water; put on the fire and stir until dissolved; boil fiercely until it reaches 315 degrees; have ready a shallow dish greased with either butter or olive oil; pour the toffee into this and let cool. If nuts are added, arrange them in the bottom of the greased dish first, then pour on the syrup, taking care not to disturb the nuts. When nearly cool mark the top the size you wish to cut it with a sharp knife. Run the knife backwards and forwards as if sawing, making a deep impression. When cool take out of the tin and it will break quite easily where marked. Flavorings and colorings may be added if desired. Butter scotch is made the same, only boiled until it reaches 320 degrees, then take from the fire and when stopped boiling add ½lb. butter, beat well and turn out same as toffee.''

Cake Icings.—Paper read by Mrs. C. Robertson (Hon. Secretary):—''There are, broadly speaking, three classes of icing. Royal icing, for rich fruit cakes, Christmas, wedding cakes, &c.; a layer of almond paste is usually put on first. Boiled icing, for plainer mixtures; and soft icing, for sponges and light mixtures. *Royal Icing*: ½lb. icing sugar, 1 white of egg, 1 teaspoon glycerine. Method—Rub sugar through hair sieve; beat white of egg slightly on a plate and stir in sugar, gradually adding glycerine; beat well from 10 to 15 minutes and a snow white icing is obtained. The object of continuous brisk beating is that a better, clear, and pliable icing is obtained. Cover basin with damp cloth and icing will keep for days. *Soft Icing*: 2lbs. icing sugar rubbed through sieve, 2 or 3 tablespoons boiling water, fruit juice, coffee essence, cocoa, vanilla, or any other flavoring. Method—Put sugar into an enamelled saucepan, add water, stir over fire until warm, then pour over the cake. Another method—10ozs. icing sugar, 4ozs. butter, essence or fruit juice; beat butter to a cream, add sugar and essence, beat well, then spread over cake. *Boiled Icing*: 1 cup sugar, 2 tablespoons cold water, white of an egg, essence. Method—Beat white of egg stiffly; put sugar and water into a saucepan and stir until dissolved; bring to the boil and boil 3 minutes, then pour over beaten white slowly; add essence and beat well until just thick enough to remain on the cake; pour over quickly. *Almond Icing*: ½lb. almond meal, 1lb. icing sugar, ½ gill spirits—brandy, rum, or sherry, 1 yolk of egg. Method—Rub sugar through hair sieve and mix well with almond meal. Beat egg and add spirits gradually, mix well with sugar, &c.; knead on a paste board with sifted icing sugar sprinkled over it; divide into 3; roll one out to size of top of the cake, brush over with white of egg, and mould on to the cake. Take another part, roll it under the hand, then use the rolling pin and roll the size of half the circumference of the cake; brush this also with white of egg and press evenly round; repeat with the other piece; let the outside become quite dry before covering with royal icing. There are so many occasions when a specially designed cake carries its own irresistible appeal. Children love a decorated cake for their birthday, and it is their chief pleasure that it is their own cake at the feast; to light the candles for the number of years gives added delight. For layer cakes, crystallised fruits, cherries, nuts, angelica, cocoanut, crystallised violets, bows of ribbon, &c., may be daintilly used in a variety of ways. For coating the cake, give 2 coats, first with water icing flavored with rosewater, to prevent grease striking through; secondly, with icing used as for piping—royal icing. Let each icing dry before putting on next coat. Then cake is ready for decoration. Choose a design, draw it on paper, and put a few pin pricks through the paper on to the cake for a guide, and after a little practice with the tubes quite dainty and effective decoration can be done. A very pretty design for a little girl's party is a doll cake. Bake cake in a high round cake tin, not too big, put in a large quantity of mixture with paper high round the tin so that the cake will rise high in the centre, forming the skirt. Also put a small amount of mixture into a ¼lb. cocoa tin to make the body. Join cake together with icing and get a doll's head or a celluloid kewpie doll cut off at the waist and press down into the cake. After icing and decorating skirt make a shawl or bertha of colored or grease-proof paper and pin on to cover up join. Pipe the edges of the bertha to neaten off, and if desired, decorate bertha with design to match skirt. Make and decorate larger cake and mount doll on it, putting candles around. A bow of ribbon on dolly's head finishes it off. Be sure that royal icing is quite firm enough to hold shape before commencing decoration.''

MILLICENT (Average annual rainfall, 29.76in.).

December 16th.—Present: Seven members.

BERRY JAM.—Mrs. H. Altschwager read the following paper:—''To make good jam the fruit must be boiled rapidly. This not only produces a bright, rich color, but improves the flavor of the jam. Quinces, pears, and apples require gentle cooking for a good flavor, but the opposite holds with the berry fruits. *Raspberry Jam*: The raspberries should not be over ripe. Put into the preserving pan and bring to boiling heat without any water or sugar. When they are boiling add pound for pound of sugar. Stir well from the start. Try and dissolve all the sugar before it boils again. Then boil rapidly for eight minutes. While still hot put into bottles and allow it to set, then cover with paraffin. *Loganberry Conserve*: 6lbs. loganberries—not fully ripe—6lbs. sugar, 2 pints water; make a syrup by boiling the sugar and water together for 5 minutes or more, skim it well, then add the fruit and bring it to the boil; cook rapidly for from 15 to 20 minutes. *Loganberry Jam*: Select one third of the berries before they are fully ripe; bring the fruit to boiling point and boil for from 10 to 15 minutes; then add sugar, pound for pound; bring again to boiling point and boil rapidly for from 5 to 8 minutes. If less sugar is used the jam must be boiled for a longer period of time.''

CHRISTMAS RECIPES.—The following were supplied by Mrs. W. Varcoe (Hon. Secretary):—''*Christmas Cake*: 1lb. plain flour, ¼lb. S.R. flour, ½ grated nutmeg, ¼ teaspoon salt, 1 teaspoon cinnamon, ½ teaspoon spice, 8 eggs, 1lb. butter, 1lb. castor sugar, 1½lbs. sultanas, ¾lb. raisins, ¼lb. currants, ¼lb. dates, ¼lb. candied peel, 2 tablespoons brandy or rum, 1 dessertspoon treacle, ¼ teaspoon carb. soda stirred in 1 tablespoon of boiling water, 2 tablespoons blanched and chopped almonds. Method—Cream butter and sugar together; add eggs, one at a time, then some flour and fruit; then add treacle and brandy; lastly soda in boiling water; put into greased tin lined with paper, and bake 4 or 5 hours. The oven must be hot when the cake is put in. Do not open oven door for 20 minutes, then reduce heat slightly; reduce it again after cake has been in 1 hour; very slow oven heat for rest of time. *Plum Pudding (Christmas)*: ½lb. flour, 2 tablespoons S.R. flour, ½ teaspoon spice, ¼ teaspoon salt, 1 grated nutmeg, ½ teaspoon cinnamon—put all these through sieve, ½lb. breadcrumbs, ¾lb. butter, 6ozs. beef suet (shredded finely), 1 rind of lemon (grated), 10ozs. raisins, 10ozs. currants, 10ozs. sultanas, 2 pieces candied peel (shredded), 2 tablespoons blanched and chopped almonds, 14ozs. soft sugar, 6 or 7 eggs, ¾ cup of milk, 2 tablespoons brandy or rum, 1 level teaspoon of carb. soda, blended with 1 tablespoon boiling water and 1 tablespoon treacle. Method—Rub butter into sifted flour, &c., add the suet, lemon rind, sugar, almonds, fruit; mix with the beaten eggs and milk; add soda, water, and treacle lastly; tie in a floured cloth or basin and boil for 6 or 7 hours; serve with brandy or custard sauce. *Short-bread No.* 1: 4ozs. castor sugar and 13ozs. flour sifted together, 8ozs. butter, ¼ teaspoon salt. Method—Stand basin containing butter over a saucepan of boiling water until quite liquefied; pour the butter slowly into the sifted sugar and flour, working it into a stiff dough; turn on to a floured board and press well together until free from cracks; roll into a round or several small ones (remembering that short-bread needs to be fairly thick); prick well with fork; slide it on to an oven tray covered with a piece of greased paper; pin the corners of the paper to shelter shortbread whilst cooking; bake for ¾ hour in a moderate oven, decreasing the heat gradually after short-bread has set firm. It should be very pale in color, not brown. *Short-bread No.* 2: 1lb. flour, ¾lb. butter, 7ozs. ground rice, 1oz. sweet almonds, 10ozs. sugar, soft or castor, 2 or 3 eggs, ½ teaspoon essence lemon. Method—Beat butter to a cream, add gradually the flour, sugar, and almonds, blanched and shredded; knead until quite smooth, divide into 3 pieces or cut into biscuits; roll out square to the thickness of nearly an inch and pinch round the edges; prick well with a fork; ornament with a few strips of candied orange peel, and bake in a moderately hot oven for from 25 to 30 minutes.''

MUNDALLA (Average annual rainfall, 19.22in.).

December 8th.—Present: 10 members and four visitors.

CHRISTMAS RECIPES.—*Christmas Pudding* (Mrs. L. Fisher): ½lb. each of flour, bread crumbs, butter, sugar, sultanas, raisins, currants, and mixed peel, 6 or 8 eggs, whole nutmeg (grated), 1 teaspoon of carb. soda, juice of 1 lemon, 2ozs. to 4ozs. nuts; mix like a cake, only beat eggs separately; steam 6 hours.

COOL DRINKS RECIPES.—*Emperor's Orange Syrup* (Miss K. Hillier): The peel of 8 oranges, peeled very thinly, 5lbs. sugar, 1½ozs. citric acid, 6 tumblers of cold water; put all in an earthenware jar and stir occasionally for a couple of days until acid and sugar are well dissolved; then strain and bottle; use a small quantity with water added to taste. *Ginger Beer*: 1½ozs. of cream of tartar, 3ozs. of whole ginger (bruised), 3lbs. sugar, the juice of 2 lemons, 2galls. boiling water, 2 tablespoons of yeast and white of 1 egg; mix all together except white of egg and yeast, which add when beer is nearly cold; stir well, strain, and bottle; is ready for use in 2 days. *Fruit Salts*: 2ozs. each of cream tartra, carb. soda, tartaric acid, Epsom salts, 1oz. of magnesia, and ¼lb. of lemon flavored icing sugar; mix all thoroughly. (Secretary, Miss K. Hillier.)

PENOLA (Average annual rainfall, 26.06in.).

November 2nd.—Present: 31 members and 16 visitors.

CHRISTMAS COOKING RECIPES.—*Plum Pudding*: 1 cup flour, ½ cup sugar (preferably brown), 1 cup currants, little lemon peel and chopped almonds, 1 flat teaspoon carb. soda, 1 teaspoon mixed spice, 1 tablespoon butter in teacup of boiling water; a few dates and a little golden syrup are an improvement, but not necessary; mix dry ingredients first; boil 2 hours. *Plum Pudding*: ½lb. butter, ½lb. brown sugar, ½lb.

1933 CALENDAR 1933

JANUARY

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1934 CALENDAR 1934

JANUARY

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APRIL

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JUNE

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JULY

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

M	T	W	T	F	S	S
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● FULL MOON.

currants, ½lb. raisins or dates, ½lb. sultanas, ¼lb. mixed peel, 6ozs. bread crumbs, 6ozs. flour, pinch salt, ½ teaspoon mixed spice, 4 eggs, a little brandy; boil about 4 hours. *Small Christmas Cake*: 1lb. S.R. flour, 6ozs. butter, 6ozs. sugar, ½lb. currants, 3 eggs, little essence of lemon; place in teaspoons on buttered slide. *Light Pound Cake*: 1lb. butter, 1lb. sugar, 1¼lbs. flour, 10ozs. each of plain and S.R. flour, 8 eggs, 1lb. currants, ½lb. sultanas, ¼lb. orange peel, 2ozs. almonds; cook about 2 hours. *Mince for Fillings, &c.*: 1lb. stoned raisins, 1lb. currants, 1lb. peeled and cored apples, ½lb. suet, 4 or 5 pieces peel, 1 teaspoon spice; put through mincer and mix well. *Salted Almonds*: ¼lb. almonds, ½ teaspoon salad oil or clarified butter, fine salt. Blanch and dry almonds and place in a baking tin with the fat. Put in a moderate oven. Turn frequently until a pale brown. Turn on to kitchen paper and sprinkle liberally with salt. When cold shake off loose salt. Keep air-tight. *Devilled Almonds*: Prepare as for salted almonds, using cayenne pepper as well as salt. Devilled almonds should be served hot. (Secretary, Mrs. F. Kidman.)

PINNAROO (Average annual rainfall, 14.54in.).

November 4th.—Present: 21 members and five visitors.

EGG DISHES.—The following paper was read by Mrs. H. Fewings:—*Egg Breakfast Dishes*: There are numerous ways of cooking eggs. Breakfast dishes should be nourishing, sustaining, and quickly prepared. Poaching is one of the lightest forms of cooking eggs. One egg is equal in food value to 1½ozs. of meat or a half a glass of milk. Eggs add nutriment, give color and flavor to mixtures, and render mixtures light. *Glass Eggs*: 1 cup cream, 2ozs. butter, 4 or 5 eggs, pepper and salt; melt butter carefully in a large enamelled plate or dish and run it all around the sides; add cream, break the eggs into a cup or saucer, keeping the yolks whole, and slide carefully into the dish; sprinkle with pepper and salt and set dish on the stove until the eggs are firm; they take 10 to 15 minutes, and must be sent to the table in the dish in which they are cooked. *French Eggs*: 2 eggs, 1 dessertspoon butter; melt butter on an enamelled plate on the stove, break 2 eggs in a basin, keeping yolks whole, and slide carefully on to plate; leave until whites are well set; sprinkle with pepper and salt and serve on same plate on which they are cooked with another one underneath. *Zingara Eggs*: Placed trimmed poached eggs on rounds of toast, pour over them a good brown sauce, slightly sweetened and having in it inch long shreds of ham. *Breaded Eggs*: Boil hard and cut in rounds, length ways, thick slices of bread, pepper and salt and dip each in raw egg beaten, then in bread crumbs or in powdered cracker crumbs, and fry in butter or fat hissing hot, and drain; serve hot. *Scotch Eggs*: Some hard-boiled eggs, 1 or 2 for each person, dip into cold water, shell, dip in cold water again, then in flour and then in beaten egg; cover with cooked minced meat and seasoning; cover carefully with floured hands and put on spoon; drop into hot fat, brown and drain. *Savoury Eggs*: Beat egg lightly, add 4 tablespoons of stock, season to taste and put in oven to set; serve on some buttered toast. *Jellied Eggs*: Hard-boiled egg, decorate dish with slices of egg and pour in carefully some seasoned stock and ½ teaspoon of powdered gelatine previously mixed. *Breakfast Dish*: Boil 3 eggs hard; make ½ pint of good white sauce; put through mincing machine some cold tongue or ham, about ½lb.; put in a fireproof dish a layer of tongue, a layer of white sauce and a layer of chopped eggs; continue this till the dish is full, put some breadcrumbs on the top and brown in the oven; can be prepared the night before and warmed in the oven. *Eggs in Cases*: 6 eggs, grated cheese, butter, cayenne pepper, chopped parsley. Method—Butter 6 souffle cases, break an egg into each, cover with a little parsley, grated cheese, and a pinch of cayenne pepper; bake in a quick oven for 10 minutes. *Baked Potatoes and Eggs*: Wash and bake some large potatoes in their skins. They should be as nearly the same size as possible, and when they are thoroughly baked cut a small hole in the centre of each and scoop out the insides with a teaspoon. Put half of it into a basin, season with pepper and salt, and beat to a light cream with a little milk. Line each potato with the mixture, leaving a clear space in the middle, and put back in the oven. Meanwhile whisk 2 eggs and season with pepper and salt, a dessertspoon of chopped parsley, and a little onion juice. Melt ½oz. of butter in a saucepan, put in the egg mixture and stir till thick and creamy. Take the potatoes from the oven and fill the spaces with this mixture, grate a little nutmeg on the top of each and serve at once. *Tomato Eggs*: 4 large tomatoes, fresh, scoop out some of the fleshy part inside carefully with a spoon without breaking the tomatoes. pepper and salt. Break a whole egg into the middle of each. Over the top lay a thin slice of bacon and a piece of butter on the top of the bacon. Put the tomatoes into a baking tin and cook in a moderate oven till the eggs are set. *Baked Eggs and Potatoes*: Pass some boiled potatoes through a sieve, season them with salt, pepper, and nutmeg; add a large piece of butter and beat until they are quite white, then stir in a small quantity of grated cheese. Take about a tablespoon of the potato at a time and roll it on a floured board into a ball, then form into a hollow case, fairly deep. Butter a china baking dish and sprinkle it with breadcrums, then arrange the cases in it. Break 1 egg at a time into a small cup and slip it carefully into a case; when all have been filled pour a little warm butter over the eggs and brush the cases over with butter, then sprinkle some dried breadcrumbs seasoned with salt and pepper and a little curry powder over and place in a fairly quick oven until the eggs are set. *Eggs in Sauce*: 1 pint milk, 2ozs. butter, 2ozs. flour, ½ teaspoon cinnamon, 1 teaspoon salt, ½ teaspoon pepper, 6 or 8 eggs. Method—Melt the butter carefully in a saucepan, without browning, add the flour, and stir out the lumps with a wooden spoon, then add the milk and stir till it boils and thickens. Flavor with cinnamon, pepper, and salt. Have the hard-boiled eggs ready, shelled and cut in halves. Remove the yolk from one and rub through a seive. Put the others on a hot dish, pour the sauce over and sprinkle with the spare yolk; serve very hot. The flavoring of this sauce may be varied, using curry powder in place of the cinnamon. *Swiss Eggs*: Eggs, bread crumbs, grated cheese, butter. Method—Butter ½doz. china or paper ramakin cases, put a teaspoon of bread crumbs and a teaspoon grated cheese in each. Carefully break 6 eggs separately into a cup and put one in each case; season with pepper and salt and place more cheese and crumbs on the top, and a small piece of butter; bake 8 to 10 minutes and serve very hot. *Savoury Eggs*: 6 eggs, ½lb. minced ham and tongue, ½ cup bread crumbs, 1oz. butter, 1 dessertspoon finely chopped parsley, pepper and salt. Method—Grease 6 little patty tins, put a few bread crumbs and a little minced ham or tongue at the bottom. Break the eggs over, keeping the yolks whole; season with pepper and salt and sprinkle a little finely chopped parsley over each. Place the tins in a pan containing a little boiling water and cook till the eggs are set. Turn out on to rounds of dry toast. ***Cheese and Egg Toast***: 2ozs. cheese, 2 eggs, 1oz. butter, 1 gill milk, 1 teaspoon finely chopped parsley, pepper and salt to taste. Method—Grate the cheese or cut in very thin slices and put it in a small saucepan with the milk; shake gently over the fire till it melts; add eggs, well beaten, and stir quickly for a few minutes till they begin to set; add butter, let it melt; season with pepper and salt and serve on hot toast. Sprinkle with a little finely chopped parsley. (Secretary, Mrs. F. Atze.)

TANTANOOLA.

December 7th.—Present: 11 members.

CHRISTMAS COOKING.—The following recipes were given by Miss Pycroft:—Only the best ingredients should be used in Christmas baking because the cakes are made to be kept for some time before using. The fruit should be washed and well aired beforehand; this will save considerable time when it is needed. For cake making fresh laid eggs are best. Christmas cakes need a good, moderate oven with a fairly even heat. Grease tins and line with paper to prevent cakes from sticking to tins. Cakes should be cold when stored in tins or they will become mouldy. Most rich cakes are better flavored if kept in an air-tight tin. *Twelve Month Cake*: 2lbs. flour, 1lb. butter, 1½lb. dark sugar, 12 fresh eggs, 1 small packet mixed spice, 2 teaspoons cream tartar, ¼ teaspoon soda, 1 teaspoon salt, 1lb. seeded raisins, 2 tablespoons treacle, ¼lb. almonds, 1lb. sultanas, 1lb. currants, 1lb. dates and mixed peel; mix butter and sugar until creamed, then add eggs, next milk, with soda in it; put flour, cream tartar, spice together; treacle is mixed in with the damp ingredients and the fruits lastly; bake for between 2 to 3 hours. *Block Cake*: 3½lbs. plain flour, 1¾lbs. S.R. flour, 2¾lbs. butter, 3½lbs. sugar, 15 eggs, 1qt. milk, 3lbs. fruit, ½lb. lemon peel, and flavoring if liked; cream butter and sugar, add eggs and beat well, add milk after the dry ingredients and mix well. Have tins prepared by cutting a petrol tin in two, lengthways, and put half the mixture in each. Bake in a moderate oven for 3½ hours. *Christmas Pudding*: ½lb. S.R. flour, ½lb. bread crumbs, ½lb. moist sugar, 1lb. beef suet, 1lb. seeded raisins, 1lb. currants, ¼lb. mixed peel, 1oz. mixed spice, peel of 1 lemon, 1 teaspoon of salt; mix together. add 8 eggs, well beaten, and sufficient brandy to moisten whole; wrap in a cloth or mould and boil 4 hours. *Cup Pudding*: 1 cup each of brown sugar, suet, plain flour, raisins, currants, and sultanas, 2 pieces peel, 4 eggs, 1 teaspoon soda dissolved in boiling water, 1 cup bread crumbs, 2 tablespoons jam; boil for 4 hours.'' (Secretary, Mrs. E. Telfer.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Williamstown ..	7/12/32	7	Question Box	Mrs. A. Cundy
Clare	3/12/32	22	Question Box	Mrs. A. Rogers
Parrakie	29/11/32	14	Special Meeting	Miss J. Halliday
Gladstone......	2/1/33	30	Visit to Baby Welfare Train	Miss M. Sargent
Pinnaroo	2/12/32	12	Question Box	Mrs. F. Atze
Clare	7/1/33	20	Papers—Misses Scott and Roach and Mrs. P Quirke	Mrs. A. Rogers

MEN'S BRANCHES.

SOUTH-EASTERN.

COONAWARRA.

November 14th.—Present: 14 members and 16 visitors.

TOBACCO CULTURE.—The following points are taken from an address delivered by Mr. S. B. Opie (Field Officer):—The seedbed should be convenient to water supply. Seedbed soil to be specially prepared. Good earthy soil is needed for young plants. If soil is naturally poor, add good earth to surface. Get plants out as soon as they are ready. Beds should be turned over early. Growers could begin cultivating in November for next season's planting. Final preparations for the reception of seed should be made to beds about the middle of August. Soil should be left loose and bed raised to allow for drainage. Wet soil should be worked a number of times to enable it to dry. For sterilizing soil, burning is most practicable. Heap brush wood on top of soil, light on side away from wind to give a good burning. Wood must be of free burning quality. All debris is then raked off. Soil must not be turned after burning. Sides of bed may then be added. *Seed Sowing.*—Do not give too thick a sowing. Thinning out, too, should be more thorough. One-eighth to one-seventh of an ounce of seed is sufficient for 100 sq. ft. For even distribution mix measured quantity of seed with cup of ashes. Divide into four parts. Use one part for each half bed, remaining two parts to be used in going over each half bed. The soil is then patted down. Only a small quantity of water should be given at a time. Do not over-water. A light mulch of sawdust will obviate frequent waterings. Red gum sawdust is good for this purpose, but wattle sawdust is not so satisfactory. A covering for the bed is an advantage; it can be of white cheesecloth, hessian, or wire netting threaded with reeds. When plants are well started, remove coverings for hours of sunlight. Coverings might act as some protection against blue mould, as spores float in atmosphere, and any protection is better than none. As regards treatment of blue mould, the digging in of the plants in the seedbed was not favored. In the early stages infected plants should be killed with a weed-killer, the solution to be sprinkled on infected patches, killing all growth and disturbing atmosphere as little as possible. Beds should then be watched carefully for further infection. The discussion that followed centred mostly on the blue mould menace. Mr. Snelling asked whether blue mould was introduced to a district by infected seed. Mr. Opie said the fungus could be introduced by the seed, but the spores of the disease would float a considerable number of miles in the air. Mr. Modistach said, ''Is it not a fact that covered in seedbeds are more subject to the mould than the uncovered ones?'' Mr. Opie: ''Once a seedbed becomes infected the fungus will probably flourish more under covered in conditions. For clean beds, however, coverings will prevent some of the spores settling thereon.'' Mr. Worthington was given the symptoms of blue mould infection—an over greenness, plants becoming yellow, by which time the downy mildew would be visible. Mr. Worthington: ''Is it necessary to have plants 4in. long for transplanting? Might not one, fearing infection, get them out earlier?'' Mr. Opie: It is better to leave plants there until 4in. long, but with care they can be put out earlier. It is a good plan to bury the plants right down to the heart.'' Mr. R. C. Modistach referred to plants with parts appearently eaten out of the leaves. Mr. Opie attributed these attacks to cut worm which could be treated with arsenate of lead, and flour. (Secretary, J. Kain.)

FRANCES (Average annual rainfall, 19.99in.).

Present: Nine members.

CARE OF FARM MACHINERY.—At the December meeting the following paper was read by Mr. R. Holmes:—''Whilst costs of productions are high and the prices for produce low, the farmer must look for some way in which to lower expenses, and the first thing is the care of the implements that return him his living. Many implements that were scrapped in good times are now called upon to render their services again. The life of an implement is what one makes it, and nothing will shorten its life more than neglect such as poor lubrication, loose or missing bolts, no protection against the weather when not in use, and the lack of common sense on the part of the operator. When seeding operations are over, clean out thoroughly all seed and super from the boxes and remove the hoes. If these are washed clean of super and oil and put in the seed box until next season, they will last many years. The binder and harvester should have a general look over before using. See that all oil cups and bearings are thoroughly clean to make sure that they will receive the oil. Any adjustments and repairs should be done as soon as the harvest is finished, while the incidents are still fresh in the operator's mind, then the machine will be ready for next year. Canvasses should be rolled up and put in a dry place, harvester belts cleaned and a dressing of neatsfoot oil will keep them pliable until next year. A coat of paint every few years will keep the woodwork of these machines from cracking and also improve their appearances. Ploughs and cultivators will also look like new if they receive an occasional coat of paint and a little attention. See that tines and shares are always tight and they will do better work and last longer. The farm engine should have a general overhaul at least once a year. Tighten all nuts and bolts and take up the main bearings. Take off the cylinder head and remove the carbon to ensure even running. If the engine is to stand for some considerable time without use, give all bright and nickel parts a wipe with an oily rag to prevent rust. Always use a heavy bodied grease and a stringy oil; these will last in their respective cups longer and will not run to waste in the heat. (Secretary, E. Pfitzner.)

MOUNT GAMBIER (Average annual rainfall, 30.52in.).
November 11th.—Present: 17 members.

The meeting took the form of a debate, "Tractor-power *versus* Horse-power on the Farm," the speakers being Messrs. W. Barrows, C. Mitchell, K. F. Collons for tractor and A. Sassanowsky, N. Aslin, G. Dodson for horses. Mr. D. A. Roberts acted as adjudicator and awarded 28 points to tractor advocates and 25 points to the debators in favor of the horse. (Secretary, G. Gurry.)

THE SHEEP BLOW-FLY.

[*Paper read by Mr. A. Adamson at the December meeting of the Rendelsham Branch.*]

Wool ranks as one of Australia's greatest assets, and, more particularly in periods of economic depression, attention should be paid to losses which, though taken in single instances, may be small, yet in the aggregate are of proportions which, if neglected, are very serious for primary industries.

The blowfly is causing considerable loss to the wool industry throughout the world, and in Australia its control is becoming a serious problem, for, at the present time, the fly is increasing rapidly. A vigorous campaign against this pest is necessary unless people wish to confront a considerable drop in the amount of wool produced, thus causing depleted revenue.

It is unfortunate that as the number of sheep have increased so have the flies multiplied. There was a period when the blowfly could be regarded as a useful scavenger, for its eggs were deposited on dead animal matter, which was speedily destroyed, but its habits have changed, for eggs are often deposited on the wool of living sheep and even on woollen blankets.

Natural breeding grounds for flies are the decaying carcasses of animals, and owing to death by disease, accident, drought, or old age, there is no scarcity of carcasses, which, unfortunately, are seldom buried, but rot on the surface of the ground, thus providing ideal conditions for the fly to multiply.

LIFE CYCLE.

The first stage in the life cycle of the blowfly is the egg deposited by the fly on any suitable breeding ground. These eggs hatch out in from a few minutes to over 20 hours, and the larvae or maggot emerging, speedily becomes active, and will feed on either living or decaying flesh. This prepupal stage lasts from 1½ to 10 days, when the larvae pupates. It pupates often under a decaying carcass, or it may burrow under the surface of the soil. This period may be as short as 5 days in summer and up to 3 months in winter. The adult fly may live from about a week to a month. A female fly will deposit from 200 to 300 eggs, and as it is able to travel over a mile in a day the scope over which one fly may cause damage shows the need for control. Seasonal changes bring either greater prevalence or lesser numbers of blowflies, according to the variety.

The Green Lucilia blowfly, which is considered the worst amongst blowflies in Australia, and in South Africa also, deposits its eggs on a fresh carcase the first day. Other species of blowflies will feed on the carcase at the same time. The brown fly deposits its eggs the second day, and when liquefaction takes place the Blue Metallic fly deposits eggs from which emerge the active hairy maggots which devour the maggots of the other species of fly. Because of this it appears that the Blue Metallic blowfly might be regarded as useful, and therefore blowfly traps are being baited to attract a greater proportion of the other varieties.

Young maggots speedily die on a dry surface, consequently any small wounds prove highly attractive, but these can be readily seen and treated. It is much more serious when fly strike occurs without any wounds. Regions stained by dung and urine are quickly susceptible. Ewes, when lambing, often get stained, and require close attention. Lambs' heads require watching for, when sucking, the wool is moistened. Abrasions at the base of rams' horns, caused by fighting, may cause trouble. Close-woolled, wrinkly sheep are most susceptible. When a sheep is struck the maggot quickly works its way through the wool to the skin, which it attacks, thus causing irritation. The animal struck may separate from the flock, bite at the irritation, cease feeding, and show general uneasiness. If struck in the crutch it will probably stamp one of either hind legs.

The affected area will become stained and ragged and invites attack from other flies. If the animal is not treated the sheep wastes away, gangrene sets in, and the animal dies.

PREVENTION AND TREATMENT.

Successful prevention will eliminate treatment, and is sought either by the destruction of flies or maggots, or by some method of rendering the animal immune from attacks by the fly. The most successful method is the destruction of breeding grounds. Carcasses may be destroyed, either by burning or burying; the latter method having the objection that the blowfly has been known to come up through 6ft. of loose soil. If a dead body is opened it will dry more quickly, and preying birds and animals attack it more readily.

In both Australia and South Africa, carcasses of dead animals have been sprayed with a poisonous solution, but great care must then be taken to ensure that animals and birds do not have access to the poison bait.

A good method is to put the dead animal into a narrow trench and spray well with arsenate of soda after opening the belly. A piece of netting over the trench prevents ingress of animals or birds, but flies are able to enter freely. It may here be mentioned that poison baits destroy birds such as crows sometimes. The crow, as a carrion eater, should hold rather an exalted position, were it not for its troublesome proclivities in other directions. It must, however, destroy innumerable numbers of blowflies.

Many types of blowfly traps have been invented since the blowfly became a serious pest, and these are found useful in Australia and South Africa. If householders in country towns, as well as farmers, used a blowfly trap the offensive entry of the blowfly into houses could be checked a good deal. Useful traps may be made of a petrol tin and some wire gauze; a cone of gauze being so inserted that entry is easy but egress difficult. In the bottom of the trap water is put and about a pound of meat. Fresh water should be added to the bait each week in summer and more meat when required. One trap would probably catch 100,000 flies in a year, and reckoning half of these as females, little doubt remains regarding the efficacy of the trap.

There are many suitable baits, their use being restricted by the material available, but it might be noted that the greater the putrefaction and stench the more attractive a bait becomes. Realising that fact points out that we should be particularly careful in seeking to prevent them from entering our homes. The maggot trap which is being used successfully in South Africa now is efficacious. It consists of a trough open at both ends and suspended from four posts so that the open ends are over petrol tins, which are so opened that there is a ½in. ridge of tin left around the top. The carcase of the animal is thrown on the trough and soon is swarming with maggots which, when full-grown, crawl away to pupate and fall over the open trough ends into the petrol tins. There they may be destroyed by pouring a little kerosene and water over them.

Swabbing or jetting, crutching and dipping, are the most effective preventive methods, and need no explanation. During the fly season the flock must be carefully watched, and those affected by fly-strike should be treated at once. In applying a dressing, surround the "struck area" with the treatment first to prevent the escape of maggots into the clean wool, and then treat the infected area. The wool over the "struck" area should be removed, and also a margin of the clean wool. If affected sheep are drafted off from the others they can be closely watched.

A successful dressing should kill the maggots, but should not injure the wool. It should also be healing as well as objectionable to flies. Its retention on the wool should be of as long a period as possible. Successful dressings are:—Creosote, 6 parts; turpentine, 20 parts; olive oil or raw linseed oil, 40 parts; or cotton seed oil, 45 parts; benzine, 40 parts, by volume; oil of tar, 10 parts; carbolic acid, 5 parts.

Observations show that, when the breeder is drafting, ewes showing excessive wrinkles or narrow breech, should be culled. By breeding from animals of this type a flock which is not so susceptible to blowfly attacks may be built up. It is noticed that the Merino sheep suffers most from fly-strike and that the attack is most often made on the fold of skin on either side of the breech. A sheep free from these wrinkles will be obtained by selective breeding, but it will take a long period. In the meantime, many graziers remove the fold of skin altogether by cutting it off with a sharp knife after pinching the fold between the jaws of a castrating instrument. There is no bleeding, and the skin edges do not separate. A ram which has its horns infected will leave the flock and will not mate with the ewes. The greatest number of flies are always found around the sheep yards, therefore yard work should be done as quickly as possible. As the blowfly comes into contact with every conceivable filth and must carry innumerable germs on it, it behoves us to make reasonable attempts to limit its existence as a pest in order to safeguard ourselves.

[The writer acknowledges assistance from publications issued by the New South Wales and Victorian Departments of Agriculture.]

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Rendelsham....	10/11/32	9	Address—H. H. Orchard	F. White
Mundalla	8/12/32	21	Address—W. Flower	A. Ross
Mundalla	12/1/33	15	Lecture—H. H. Orchard	A. Ross
Mount Gambier.	9/12/32	10	Address—D. Roberts ...	G. Gurry
Mundalla	12/1/33	15	Lecture—H. H. Orchard	A. Ross

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WILMINGTON (Average annual rainfall, 17.43in.).

November 8th.—Present. 14 members.

SHOEING HORSES.—Mr. N. Daly read the following paper:—"*Method of Shoeing Horses*: First prepare the hoof to obtain an even bed for the shoe by cutting away all waste hoof with a toe knife and hammer. This is best done by starting at the right hand quarter of the hoof and follow around the toe to the left-hand heel, then take down the right heel and turn up the frog and corns, if any. Should the hoof be very long, it is best to shape same before starting to cut down. The size of the shoe is then selected and fitted to the horse's hoof, all holes being punched out from both sides, and the heels sprung. This is to relieve the heels of the hoof, where corns are most likely to be found. All nails must be driven in evenly and have a good grip of the hoof. The first nail to be driven is in the left-hand toe, the second in the right-hand quarter, and the remainder on the opposite side to where the shoe is wanted to be spread. The hoof is then cut off around the shoe with an old toe knife, and the nails prepared for clinching. Then the hoof is brought forward and held on the shoer's knee, the under nails filed and clinched, and the hoof rasped back level with shoe. It is not necessary to use the file end of the rasp on heavy horses." (Secretary, P. Cole.)

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

KOOLUNGA (Average annual rainfall, 15.52in.).

November 15th.

ANNUAL CROP INSPECTION.—Although the attendance was not as large as it should have been for this important occasion, a very interesting day was experienced by those present. The first farm visited was that of Messrs. Button Bros., on the Broughton Flats, where about 600 acres were under crop. The main varieties sown were Florence, Palestine oats on stubble, Captain, Gluyas, Nabawa, Sword, and Aussie, the latter three appeared as though they should yield well, although Captain was a better looking crop, but rust was present and would likely affect the yield. On Mr. S. Perrin's farm the principal wheats were Sword, which was the best crop seen for the day and the best crop seen in the district for many years—a wonderful crop, free from disease, even, and only an odd turnip in it, and it should yield around 35bush. to 40bush. per acre. Lunch was provided by Mrs Perrin. Mr. Hartley's was the next farm visited, the main wheats being Early Gluyas, Aussie, and Sword, the latter being a wonderfully even, clean, and thick crop. Mr. A Whitehorn had a very thick crop of Aussie, which should yield well—it was inclined to go down a little; he also had a crop of Currawa, which was about the cleanest of that variety seen for the day, *i.e.*, free from barley. Mr. E. D. Whitehorn's best crop appeared to be a crop of Sword, which was very similar in appearance to Mr. E. H. Bentley's. A crop of Waratah was also very clean and even, although not so thick as the Sword. Mr. Buchanan's farm was next visited. Here the crops were looking remarkably good, but one variety in particular had gone down, and lifters would probably be necessary to harvest it, but it should give a good return. Mr. Ern Bentley's early wheats appeared as though they would yield above the late wheats, the latter being a little on the thin side. On Mr. C. Fuller's holding visitors inspected a wonderful crop of Captain—clean, even, and thick, but slightly affected with rust. The rest of his crops were even and free from disease. Nabawa appeared to stand out amongst the other varieties. The most interesting call for the day was made at Mr. F. Pedler's property. Mr. Pedler specialises in the preparation of seed wheat, and not a head of barley was to be seen on the farm. He also grows more oats for hay and feed than most farmers. In his seed wheat plots he had Early Gluyas, Ranee 48, Rajah, Mogul, Gurka, Guyra, and Calcutta Cape oats. Mr. Pedler disposes of much seed wheat every year on account of its cleanness and being true to type. Mr. F. H. Jones was next visited; his chief wheats were Nabawa, Aussie, Sepoy, Sword, and Felix, the latter being affected with rust. Mr. Sykes had very good crops sown on fallow. It was hard to say which would yield the best, as they were all even, clean, and free from weeds. He had obtained some Ford from the college last year which should yield well this year. Wheat obtained from the College is well distributed around the district the following year. He also had fine crops of Dan and Currawa. On Messrs. Freeman Bros.' farm a large area was under crop. The principal wheats were Nabawa, Currawa, Sword, Sepoy, and Captain. Nabawa was a very clean crop and should yield well. Mr. C. Longmire's best crops appeared to be Dan and Nabawa, the first being a very thick crop, clean and very even, and should give a very good yield. He also had Caliph, but rust was present in it and would probably affect the yield. Mr. H. Spencer had a large area under crop, and it all looked excellent, especially Nabawa, Sword, and Dan. A crop of Felix had gone down very badly and was attacked by rust. Mr. Pedler had some plots. Mr. Spencer's plots created much interest. He had a wonderful hay cut of Guyra oats sown around the fence. Members also saw a new 10ft. sun header which was also of interest to surrounding farmers. The day ended by visiting Mr. M. C. Bentley's, where a wonderful crop of Sword was seen and also a very thick crop of Sepoy and a small area of skinless barley, which had broken off at the second node throughout the crops. The most outstanding wheats for the day were Sword, Nabawa, Dan, and Aussie.

The meeting held on November 1st took the form of a Question Box. (Secretary, I. Jones.)

KOONUNGA.

November 8th.—Present: 20 members.

The Value of Systematic Working of the Farm.—Mr. H. Mibus, in the course of a paper on this subject, said the systematic working of the land, with a convenient lay-out of all out-buildings, yards, and paddocks was of considerable importance, because it resulted in a very real saving of time and labor. Another point too often overlooked was the proper care of the plant necessary for the working of the property. (Secretary, G. Cartwright.)

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BRINKWORTH (Average annual rainfall, 15.74in.).

October 17th.—Present: 18 members.

The Wheat Bounty.—Mr. L. E. Ottens read the following paper:—"During the time when low prices are ruling for wheat, it is essential that the Government assist the producer in order to minimise his losses as much as possible. This can best be done by paying a bounty on wheat. Last year the Government paid a bounty of 4½d. per bush. on all wheat sold by the producer, but this method of paying a flat rate does not attain its object, which is to give most help to farmers in the drier areas who have suffered the greatest losses in the recent dry seasons. I would suggest the introduction of a sliding scale for the payment of a bounty of, say, 8d. per bush. for the first 1,000bush. sold by the farmer, 6d. per bush for the next 2,000bush., and 4d. per bush. for the balance. In this way the small farmer would get more help per bush. than the larger farmer. Many reasons have been advanced why a bounty should not be paid on wheat, and one realises that the payment of a bounty with public money, which must be raised by taxation, is uneconomic, because more money must be raised than will be returned in bounties because the cost of administering the fund must be taken into consideration. Under the existing conditions the farmer has to pay high prices for all his requirements, when that is one of the principal causes why the cost of producing is higher than the price of the produce. As the payment of a bounty is not desirable from an economical point of view, drastic steps must be taken to remove the cause which makes the payment of a bounty necessary, *i.e.*, remove all tariffs and duties which tend to increase the cost of production and the cost of living. If that is done all other costs will automatically be reduced in proportion, but as this can only be done gradually, it is imperative that the bounty be paid until the cost of production has been reduced to a minimum. Producers must face the fact that the present low price of wheat is not a temporary one, and until drastic changes are made the bounty must be paid. If no bounty is paid to assist the producer to make both ends meet the result will be disaster to both the producer and the nation. It is obvious that the producer cannot continue to grow wheat at a loss, as he is doing at present. The Government in the past has made large sums of money available for assistance to necessitous farmers to enable them to keep on producing. This assistance is a temporary expedient, but if continued, it will result in ruin to the producer and the State, because it will add each year many names to the already long list of those whose business is entirely controlled by the Farm Relief Board.''

AN IDEAL FARM HOMESTEAD.—Paper by Mr. E. R. Ottens:—''First select a site on rising ground to assure good drainage. The house should be built as near to the centre of the farm as possible. It is desirable to build the house about 5 to 10 chains from the road, so that an avenue of trees can be planted, for which purpose the Aleppo pine is most suitable. A ramp can be made alongside the gate for the convenience of vehicles. This could be made of railway irons about 12ft. long. A pit should be made about 4ft. deep and measuring 6ft. x 12ft., with a 9in. concrete wall built inside with two cross members placed 4ft. apart. Each end of the rails should be placed 6in. apart in concrete. The ramp should be above the level of the ground to prevent silt from washing in. A 5-roomed house and all conveniences will prove suitable. It should be built with a bungalow roof with a verandah all round and electric light installed. The kitchen being the most used room in the house, it should therefore be given the most thought. The cellar should be built under the kitchen, so that the steps to same and a pantry can be made in the kitchen. A small lift could be made which would save much walking down the cellar. This could consist of a small safe measuring about 2ft. square and 2ft. deep. It should be fixed to a wire rope placed on a pulley about 4ft. above the floor, and a weight to balance it on the other end. The kitchen, bathroom, and laundry should have fresh water laid on. This could be done by electric generator and pump, with a 5gall. airtight tank. The generator would automatically start pumping as soon as a tap was opened. The motor garage and laundry could be built at the back of the house. The garage should be large enough to accommodate two cars. It should have a cement floor and a pit for the convenience of greasing cars, etc. The laundry and bathroom should have earthenware pipes to drain away all waste water. A cyclone fence should be erected and a hedge planted around the house. A flower garden will help to complete an ideal homestead. A vegetable garden should be laid out and also various kinds of fruit trees planted. A mistake made on many homesteads is not planting enough trees; they help to make a place attractive and provide shelter. For this purpose either the Aleppo pine, pepper or carob trees are very good. Do not plant any trees too close to the garden, this will result in much unnecessary watering. The stable and sheds should be built in the form of a square, with the house about 2 chains from the latter, care being taken not to build any sheds in front of the house. A blacksmith shop should be erected and all necessary tools installed. This will save many blacksmith bills. The stable, chaff shed, and cow shed should be built of iron, the yards of the stable and cow shed being given enough fall to ensure good drainage. To save time, build the stable and cow shed as close to the chaff shed as possible. The implement shed should be built of either iron or stone walls with an iron roof. Provide doors along the front and part of the back so that harvesters and trollies can be driven in. Place the wheat barn separate from any other shed in order to reduce trouble with mice to a minimum. Iron is best for the fowl shed. Various small sheds should be erected for chickens, and a netting-wire yard around the shed so that the fowls may be locked in at night. Keep all livestock well away from the house, otherwise they may cause much unnecessary drift.'' (Secretary, H. Ottens.)

GREENOCK (Average annual rainfall, 21.56in.).

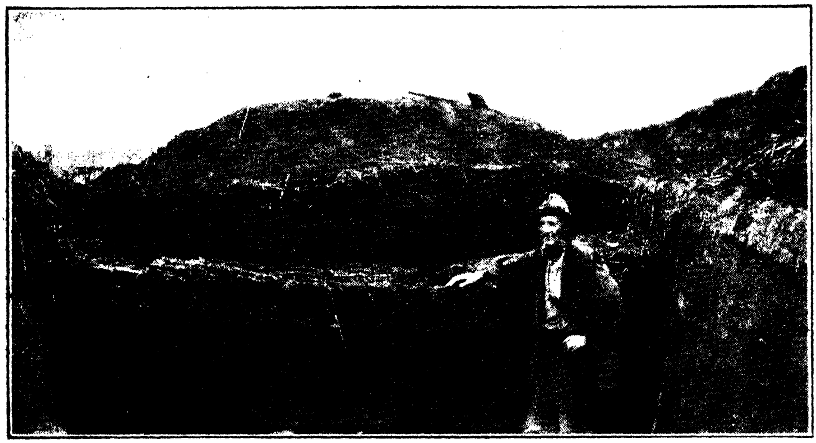
December 19th.—Present: 22 members.

FARM MACHINERY.—Mr. C. Werner read the following paper:—''Thousands of pounds are lost annually by Australian farmers consequent upon the depreciation of agricultural implements. This wastage cannot be entirely eliminated, but a substantial saving can be effected by the provision of adequate housing, and by painting as a protection against the elements. All implements used in connection with farm work should be kept under cover when not in use, preferably under a galvanized iron roofed shed enclosed on three sides either by a stone or galvanized iron wall. Do not allow the implement shed to be used as a fowl roost. During rainy days in winter each machine should be thoroughly overhauled and cleaned. All badly worn parts should be replaced and all nuts tightened. By doing this a lot of valuable time will be saved during seeding and harvesting. When machines are in use all axles should be kept well greased, and all bearings oiled regularly. The canvasses of the binder should be loosened every night, and on a harvester or stripper the belts should be slipped off after work to prevent them from stretching. On the drill or combine in seeding time, the fertilizer and grain drives should be turned each morning with a wrench or handle to loosen same, and thus prevent breaking the gearings, especially where dry pickled seed is used. All other tools used on the farm, such as fencing and blacksmith tools, &c., should be kept in a shed on proper shelves, and always after using be put back in the same place. All fork, spade, shovel, pick, and axe handles should be oiled twice a year and kept in a cool and dry place when not in use. The harness should be oiled twice a year with fat black or neatsfoot oil; this will double the life of the leather.'' (Secretary, A. Schubert.)

LIGHT'S PASS.

Present: 25 members.

The meeting of November 14th was devoted to ''Young Members' Night,'' when the following papers were read:—''Cultivation and Manures,'' F. Boehm; ''Animals of Australia,'' G. Boehm; ''Birds of the District,'' D. Boehm. The President, Mr. W. Koop, gave a report of the Tanunda Conference. (Secretary, C. Verrall.)



Mr. R. Baker, of Two Wells, had a successful manufacture of ensilage from a mixture of cereals in the sheaf. He dug a trench 6ft. deep and 12ft. wide, and the silage was covered with 18in. of earth. The photo. shows well consolidated ensilage with practically no waste.

TRURO (Average annual rainfall, 19.96in.).

November 14th.—Present: 15 members.

HORSES: BREEDING AND MANAGEMENT.—Mr. P. Klemm read the following paper:—''The foal should have its tail cobbed when it is about 8 days old. Cobbing the tail is very simple, and it makes trimming the tail easier and gives the horse a better appearance. When the filly is 2 or 3 years old, if well bred and grown, she should be put to the stallion. The mare in foal should be worked up until foaling, but with no heavy pulling or she is likely to slip her foal. If the mare is turned out in the paddock weeks before she is due to foal, she is likely to become too fat and have trouble at foaling. Once the mare has been bred from put her to the horse every year. Always breed from the best stallion procurable, which should have clean, strong flat bone with plenty of silky hair on the legs and be well marked. *Sore Shoulders.*—'Prevention is better than cure'; the collars should be well looked after. When they become flat and hurt the horse they should be relined and stuffed, but the saddler should always be told where to put the pad. When the horses are brought in after running out for some time they should only be worked half days for a start or a couple of hours in the morning and a few hours in the afternoon. The team should be given a spell each round to allow the horses to cool down. This will steady them and prevent the shoulders from becoming over-heated and scalded. After the horses have been unharnessed for the first few days their shoulders should be washed. I use a watering can and wash the shoulders with my hand as I pour on the water; then when the horses come in next day their shoulders feel like velvet. The team should never be worked after sunset. Putting a horse into the stable wet with sweat at night is likely to cause a cold or colic.'' (Secretary, L. Davis.)

ORCHARD PESTS.

[*Paper read at the December meeting of the Watervale Branch.*]

The care of an orchard is not a simple matter or one that can be conducted in a haphazard manner. Native fruit trees have been taken from their wild nature in the scrub, and scientists have, after years of patient work, produced from sour, bitter fruit a wonderful produce, beautiful to eat, and above all, capable of producing a hundredfold the yield of the original tree. These trees are now produced by the millions in nurseries and planted out in orchards running into thousands of acres. But Nature has not allowed this development without protest, for insect pests have increased even more rapidly than scientific fruit production, and scale, mites, aphis, &c., are known wherever fruit trees are grown commercially. But scientists have for years been busy afield trying to control insects and diseases. The spray pump is the gardener's defence. With it he can control the host of invading pests. There are two divisions to be fought: (1) The active marauding battalions of chewing insects, and (2) the multitudes of sucking insects. Each must be differently met, and for this purpose the sprays to be used are divided into two classes—poison sprays for chewing insects and contact sprays for sucking insects. Poison sprays are spread over the surfaces of leaves and fruits, no attempt being made to reach the insects, which indeed, may be far away at the time when the spraying is done. The attack is not direct, it is rather a defence against swift raid. The insects appear, then settle down to devour and to destroy, and the poison is absorbed with their food and kills them. Contact sprays are for direct attack. They must be thrown right on the insect. They kill either by blocking up the spiracles and cause suffocation by their caustic or burning action, or by internal irritation. Insects have no lungs, and their breathing is simple. They do not breathe through the mouth, but with a number of minute openings, which are to be found on the body. These openings are termed spiracles, and are directly connected by internal tubes with the vital organs. Suffocation will result from the clogging of the spiracles, and most contact sprays kill in this way, although a certain internal irritation is also set up. Some sprays kill by caustic action, and literally burn up the insect. The chewing insects are so called because they possess jaws with which they tear and chew the plants or trees. The sucking insects receive their name from the pointed tube through which they suck the tree juices. The chewing insects are active. They crawl or fly about at will. The sucking insects thrust their pointed beaks into the plant, and are contented with that until the food is depleted or the plant poisoned by their continual sucking.

THE APHIDES.

These are met with in flower gardens, shrubberies, plant houses, orchards, and cultivated fields. The rose, peach, apple, orange, and cabbage, each has its own aphis pest, and the most wonderful thing about them is the marvellous rate of their increase. The hosts which one notices clustered upon the stems and arms of the trees sucking the juices consist of brood mothers only, the perpetual breeders. They are an insect which produces live young in the summer months, and through the season a generation of winged females arise. These fly from plant to plant and from garden to garden. A late season produces still another generation. It consists of winged males and females, which live the briefest of lives, and the females lay eggs in sheltered places such as the crevices of the bark. These eggs bridge the space between season and season, for they do not hatch until conditions are favorable for the insects' development. The aphis best known to the gardeners is the Woolly Aphis. This pest attacks the apples and starts on the young wood or where the bark is broken. It will also attack the roots, and there being sheltered, multiplies rapidly, often destroying the trees. Most trees nowadays are budded upon blight-proof stocks, which keep the roots free and leaves the top only open to attack. The irritation of its attack causes the development of carbuncles upon the trees. In addition to the sticky coating which they, in common with other aphides possess, each aphis weaves over itself a covering of whitish strand-like thread—resembling wool in appearance—and the covering is water proof, and because of this the aphis is able to live on the trees through the winter. The best way of destroying Woolly Aphis is to spray the trees with red spraying oil at a strength of 1-25 as soon as the foliage is off, and make sure that the spray has penetrated through all crevices. But owing to the depth of same, this is almost impossible when the trees are badly infested with aphis. Therefore, inspect the tree after an interval of six or eight weeks, and if any living insects are found, then a second spray should be given. The second spray may be given when the buds are moving.

Peach Aphis.—There are two classes of Peach Aphis, the black and the green. The black aphis often appears on the tree in the middle of winter, but it does very little damage until the first warm months of spring, when it begins to multiply rapidly. The young twigs are soon covered with insects and are weakened or destroyed. The fruit leaves fall, and the shock to the tree is such that it takes two or three years to fully recover. It continues to feed upon the new growths whilst the cool weather lasts, but disappears with the first hot winds and leaves eggs on the twigs which will hatch next autumn or spring. The old way of combating this aphis was to spray the trees with tobacco wash in early spring—when the insects were thick upon the trees—but spring spraying is always difficult. The foliage shelters the insects from the spray, the tender young wood is easily injured by powerful spray, and the work in the orchard at that time is so pressing that little time can be spared for spraying. It was once thought that this aphis wintered on the roots of the trees and climbed up the trunk in early spring. It is now known that the eggs are laid upon the bark during the previous summer and that from them the winter and spring broods arise. The best spray for this pest is the red spraying oil used in spring when the buds are moving, using 1-30 emulsion. Another spray which I intend to try this year is ½ pint of nectaline to 40galls. of water with ½lb. of spreader mixed in the bluestone and lime spray just as the buds are showing pink. The green aphis is closely followed by the black aphis, which attacks the tips of growing shoots, and it hides itself beneath the young leaves, which crinkle and curl under its attack. The one spraying will do for the both aphides.

THRIPS.

The pest of onions and rose gardens, and in occasional years the curse of the gardeners. They usually appear in late spring, for they favor dry, clear heat, and then they may be disregarded, for it is the flowers alone which tempt them, and by that time the fruits have set. But there are certain early dry springs when the thrips and the flowers come together; they gather around the loosening buds and await the unfolding of the petals, and whilst these are still arched protectingly over the heart of the flower they tear and push their way between the folds and reach and destroy the stamens—the bearers of the fertilising pollen. The flower, injured in its most vital part, and now without a purpose, perishes, and the fruit crop is lost. The original invaders are soon reinforced by hosts of young insects which hatch from the eggs laid beneath the bud scales. They are wingless and cannot move freely from one tree to another and are the more greedy in that they must procure their food from the flowers near which they were born. To overcome this pest a poison spray is useless. Therefore, a contact spray is necessary; one that will penetrate to every hidden place on the tree, and I advise red spray oil, 1-20, sprayed upon the tree when the buds are bursting. That will destroy the insects and eggs that are there, and as the odour is distasteful to the insects, they will not come near for some time, and when the flowers have opened, the greatest danger is past. The late blossoming trees are troubled by the insects much more than others.

MITES.

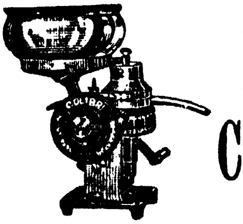
These insects are related to the spiders, and are at times so small that the eye unaided cannot see them, yet the work of their teeming millions proclaims them from afar. Blotches on leaf and stem, dark stains upon the fruit, and bunches of withered leaves, may be seen, and the puzzled gardener, prying with eyes and lens, and finding nothing more, talks of some mysterious disease, dangerous sprays or poison compounds within the soil. Mites can both bite and suck, for they are provided with jaws and hollow beaks, they can thus eat their way into leaf and fruit and in the midst of the juices, suck their fill. Many live much of their lives beneath the surface, and there shelter from weather and sprays. The best known are the red spiders. This creature receives its name from its general resemblance to the spiders and because some of its kind spin webs. They attack garden plants and orchard trees, fastening themselves upon the undersides of the leaves. The first sign of their presence is a marbling of faint yellow streaks through the natural green. On some plants the leaves curl, shrivel, and fall, they hang faded, and in time fall. Reproduction is by eggs, those laid in summer hatching quickly, whilst those deposited at the approach of winter remain unaltered until hatched by the hot sun of late spring. The eggs are hidden in folds of the buds in hollows of the trunk, under splinters of dead wood, or even upon earth clods. There is another mite which is often mistaken for the red spider—the Byrobia—a mite which in life, history, and habits it resembles, though it is not a web spinner. It is one of the deadliest of orchard pests. It attacks almonds, apples, peaches, plums, and all deciduous fruit trees. The winter eggs are thickly packed around buds or in the bark folds, and they look like reddish dust and are at times so numerous that they blaze the trees with bands of vivid red. Spray trees or bushes before the buds burst in spring, and destroy all rubbish and cultivate ground thoroughly, or break up the shelters in the soil.

Blister Mites.—Pear leaves spotted with brown and red are the first signs in the orchard of the pear blister mite. Each spot is a tiny blister or gall, the living home of families of mites. They are usually along the lines of veins, and the whole leaf blackens and falls. The mites shelter themselves through winter under the buds, scales, and amongst the hairs of the bud and stem, and eggs may bridge the spaces of the season. The tree should be sprayed just before the buds open, with oil, 1-20; for after they have burrowed into the leaf it is impossible to reach them.

The red scale may have two broods in southern Victoria and five in Queensland. It has been estimated that the descendants of one female of San Jose Scale in a single season may reach the enormous number of 3,216,080,400.

SPRAYS.

Red Oil will mix easily with water, and is one of the simplest sprays that can be used for insects. It is composed of mineral oil which has been tested for killing or destroying insects and also its invigorating action upon plants. One part of oil to 60 parts of water will destroy the common ant in a few seconds, and it is a spray that does not contain caustic. A spray that contains caustic should never be used on fruit trees. The gardener has two ways of testing his sprays; firstly, its action upon the operator's hands. A substance which will burn human skin must also injure the equally delicate buds or bark of the plant. Secondly, the check given to the plant. A strong, healthy tree will unfold its leaves and open its flowers easier than a weak one. The retarding of leaves and blossom is, therefore, a sure evidence of a check, and this is the action of all caustic spray. Sulphuric acid when applied to vines causes them to come late into leaf. Lime sulphur used on deciduous trees delays the blossoms, and the check thus given is not only noticed at the flowering time, but throughout the season. Red oil, when judged by these tests, comes out victoriously. It contains no caustic substances and will not injure the most delicate tissues when rightly used. In places it has been used for trees injured by burning suns. Further, it hastens the blossoms, thus proving its tonic qualities, for trees sprayed in winter will blossom from 10 to 14 days ahead of others, and some trees, such as Rome Beauty and Five Crown apples, usually open their blossoms much later than others. Fruit setting on these is doubtful. A sudden hot wind may scorch the flowers, or hosts of thrips may destroy them, and the crop on these is often light or a failure, but spray the trees in July with red oil, it will prevent these accidents, and greatly increase the yield of fruit. Growers who have used it regularly estimate their increase on these apples at fully 100 per cent., and it is a fact that the vigor of a parent is imparted to the offspring, and thus the largest flowers form the largest fruits, and they are the surest setters. It is from them that the seedsman gathers his choicest seed, and to them that the gardener looks for his harvest. The strong flower is the first to open, and only the immatured and weakly buds bloom late. A few flowers well developed are worth a host of half-matured flowers.



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Spraying Calendar.—In our uncertain climate, and with our vast range of latitude, no spraying calendar can give exact dates. The true calendar is the tree itself, and this the wise grower must learn to read. Right or wrong is the matter of the condition of the tree, the development of the infecting insect, and weather conditions. It is always best to spray with oil on warm, sunny days. A hard water is one in which soap will not lather or the sign of rising to the surface of free oil or curdled scum. Hardness of water is due to the presence of minerals such as lime or magnesia. They curdle the soap, but ordinary washing soda united with the lime or magnesia forms a compound which is neutral to soap, it can then be used to soften hard water. When testing spring water for the making of oil emulsion, dissolve ¼oz. of soda and add to it 3galls. of water, then add a primary emulsion made with ½ pint of oil and ½ pint of water. Allow this to stand a few minutes. If it is then all right go ahead with the spraying, if not, add a little more soda—¼oz. to 3galls., or 8ozs. to 50galls. of water is usually sufficient.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Koonunga	14/7/32	25	Annual Meeting	G. Cartwright
Koonunga	16/8/32	27	Address—"Pruning," B. Boehm	G. Cartwright
Light's Pass....	12/12/32	31	Address—H. B. Barlow .	C. Verrall
Lyndoch.......	13/12/32	16 and 10 visitors	"Fire Control".........	J. Hammatt, Williamstown
Penwortham ...	1/12/32	15	Address—G. Quinn	A. Jenner
Greenock	16/1/33	44	Lantern Lecture—C. F. Anderson	A. Schubert
Roseworthy ...	18/8/32	—	Cinema Lecture—Int. Harvester Co.	S. Bowden
Roseworthy ...	19/9/32	14	"Woolclassing," C. Goddard	S. Bowden
Roseworthy ...	10/10/32	—	Cinema Lecture—Automobile Association	S. Bowden
Roseworthy ...	1/11/32	—	Addresses—A. G. Taylor, O. Cundy, Turner	S. Bowden
Roseworthy ...	8/11/32	—	Visit to R.A.C.	S. Bowden
Penwortham ...	26/1/33	8	"Co-operation," G. Turner	A. Jenner
Lone Pine	23/1/33	14	"Handy Man on the Farm," B. Fromm	T. Fromm, Tanunda
Greenock	16/1/33	44	Lantern Lecture—C. F. Anderson	A. Schmidt

YORKE PENINSULA DISTRICT.

BRENTWOOD (Average annual rainfall, 15.54in.).

November 24th.—Present: 14 members and 40 visitors.

Mr. R. Hill (District Agricultural Instructor) delivered an address, "Diseases of Wheat," and presented to Mr. G. L. Tucker a Life Membership Certificate of the Agricultural Bureau.

THE HANDY MAN ON THE FARM.—At a previous meeting of the Branch a paper on this subject was read, in the course of which it was stated that one of the jobs that the handy man on the farm should always give attention to was the kitchen wood box, to see that it was always full, and if possible to lay on a water supply to the kitchen and wash-house. Close to the homestead three or four small paddocks should be fenced in for the cows and a light horse. If a large bin was constructed along the side of the pig yard and kept filled it would save much time and feeding time. All the machines should be kept in working order, fences in good repair, and a flower and vegetable garden laid out. Time would also be well spent in making a secure house and yards for the poultry. (Secretary, E. Carmichael.)

WESTERN DISTRICT.

BALUMBAH.

November 16th.—Present: 16 members.

AN ENGLISH FARM.—Mr. H. Ellis contributed the following paper:—"Various methods of farming prevail in different districts in England, as everywhere, but for the purpose of this paper it is proposed to describe what is known as a mixed husbandry farm. Four hundred acres is considered to be a fairly large farm in England, and this acreage requires no small amount of skill to run successfully. The size of the English fields is always a source of astonishment to Canadian and Australian visitors, who are accustomed to large paddocks, but the fertility of the soil and the necessity for small fields for large stock-carrying capacity are such that it would be impossible to adopt anything like the system which prevails in Australia. Naturally, soils vary from light to stiff, heavy, or clay lands, and the methods of working also vary. The farm is divided into many small fields, varying in size from 5 to 20 acres. The fields are divided in different ways according to their geographical position. Farmers in low lying districts like Lincolnshire Fens divide their fields by drains or dykes, which serve a double purpose. On the north country farms and in stony districts, stone walls are built. These are about 2ft. to 3ft. wide and 3ft. to 4ft. high. No mortar is used, the stones being packed together. In other parts of England, fields are divided by hedges, which are distinctive of the English countryside. These hedges are trimmed each year, some being kept low by having the long branches half cut through, bent down, and woven in among the lower stems on either side, whilst others are allowed to grow 8ft. high. Strong growing shrubs are used, which include whitethorn and hawthorn; wild roses, blackberries, and honeysuckle are also entwined, and in spring, when the red and white may are flowering, together with the wood violets and primroses, which nestle under the hedge, the beauty and fragrance is wonderful. Most farms are rented, and the agreements usually provide for a proper system of crop rotation, so that the land shall not become impoverished. Also it is a wellknown axiom that all produce except corn must "walk" off the farm. It is a poor farmer who sells hay! The crops include wheat, barley, oats, grasses, and clovers usually called seeds, beans peas, roots, which include swedes, mangels, turnips, potatoes. Huge cabbages are grown for stock. In addition, pastures or meadows are permanent. Various crop rotations are followed, bare-fallow is very rarely seen on the light lands since the introduction of forage and root crops, for these crops are consumed on the land, or at the farm buildings, and are returned to the soil to renew its fertility, whereas wheat, barley, and other corn crops are sold off the farm and act as exhausters. Thus, not infrequently, root crops take the place of the bare-fallow. Different crop rotations are used for different soils. Clayland—Fallow, wheat, clover, wheat, oats, beans. Norfolk Four Course—Roots, barley, seeds, wheat. Northumberland—Roots, barley, or wheat, seeds, oats. East Lothian (Scotland)—Roots, barley or wheat, seeds, oats, potatoes, wheat. On calcareous soils, clovers, beans, peas, and vetches usually form a conspicuous feature. On peaty soils, rape, kohl-rabi, and oats are widely cultivated. On light soils, turnips and barley are grown to perfection; and on strong or stiff soil, wheat, beans, mangel-wurzel, cabbages, and kohl-rabi give excellent results. Haymaking begins in June. This is meadow hay; then follow "seeds" harvest. Next comes corn. This is taken off with a binder, carted and stacked, then threshed in winter as it is required. By September, roots crops are gathered, potatoes are stored in "pies." The earth is levelled, a layer of straw is placed on the ground, potatoes are placed in beds about 6ft. to 8ft. wide at the bottom, tapering to a point in the centre. They are covered with a good layer of straw and 1ft. of earth on the top to keep out frost. Swedes and mangels are dealt with similarly. When preparations are completed for winter, cattle are brought in about the middle of October until the middle of May, and during this period they are hand fed and kept in stalls and stockyard. Swedes are the staple food of sheep and cattle from January to the end of April. Turnips supply food up to Christmas. Mangels will keep two years. When frosty weather begins, manure is carted into the fields and spread. In spring, drains are cleaned out and hedges trimmed. There are both autumn and spring sown wheats, which, when 2in. or 3in. high, are rolled. The stock carrying capacity of the comparatively small farms in England is amazing to the Australian. The farm I am describing would carry at least 10 to 12 horses, 10 to 20 dairy cows, 20 to 30 steers and young stock, 12 pigs, and 400 to 500 sheep. The buildings have to be commodious and convenient as they are needed for four important objects:—First, for the comfort of livestock, second, for the preservation and accumulation of manure; third, for the preparation and storing of grain; and fourth, for the stores of cake, artificial manures, wool, and other substances required on farms. The general form of farm buildings is rectangular. These consist of strongly built stone buildings, able to withstand severe climatic conditions. When conveniently planned, they make the task of the laborers much lighter. The number of men required to run a mixed farm of 400 acres would be at least 3 men and 2 boys, besides the farmer himself." (Secretary, A. Jericho.)

ELBOW HILL (Average annual rainfall, 11in. to 12in.).

September 6th.—Present: 11 members.

Co-operation in Farming.—The Rev. H. White presented the following paper:—"Co-operation is being practised more and more on every hand, and should be examined by farmers and all others for a solution of the pressing problems of life of to-day.

Co-operation is the pooling of resources and experience for the mutual profit and benefit of each other. Individualism dies hard. The individual, whether farmer or other, likes to feel that he still has freedom of action; he thinks that his independence is best expressed by doing everything for himself in his own way and in his own time. What he does not always see is that his interest in a very large degree is also his neighbour's interest—both have the same problems, yet there is a certain amount of suspicion and distrust which prevents each from co-operating with the other. In the cities, once upon a time, every citizen provided his own water supply, lighting, transport, police protection, etc., but now we know how it has been recognised as essential that a central authority should provide these for the comfort and convenience equally of every citizen. Hence we have trams, trains, electric light, gas, water supply, sewerage, and many other things under control and produced co-operatively for the benefit of all. It may be objected that this is not co-operation, but largely nationalism, and is an encroaching evil that must be resisted. The financial, industrial, and agricultural world is in a turmoil; of the myriad voices of experts who claim to be able to cure us, which are we to trust? The old methods will not do. That is certain. The farmer will be obliged to consider other methods, and this at least offers him some way out. What are our troubles to-day? *Financial.*—The money markets are in the hands of the private speculator and capitalist. The plea is that we should co-operate by means of central banks, and national institutions that will adjust exchanges on an international and co-operative basis. *Marketing.*—The only fault one has to find with the present co-operative schemes is that they do not go far enough. The venture has been made, but fear and lack of faith has impeded progress. It is high time our interests were cared for by some one responsible to the whole body of farmers. Everybody knows that banks and big financial houses have experts watching every detail of the legal side of their business. They are organised in every possible way, and everyone also knows that the farmer is an individualist, and therefore at the mercy always of every financial influence. The best known name for co-operative wheat selling is the Pool. If the pool is merely formed to control the market and force up prices, it generally defeats itself and becomes unpopular, but if it exists to sell and also to buy in the best market and at the cheapest rates, then it is a good and necessary thing. I question whether the competitive method of buying or selling wheat has benefited the farmer. The market exists, if there were no merchants to do the trading, and a board of directors having the confidence of the farmer would make a distinct difference to the handling of the harvest. Chartering freights, more efficient handling at main outports, and the purchase of bags or initiation of bulk-handling could all be carried through more expeditiously. By co-operation in farming is meant something very much like the formation of a company by a body of shareholders, who shall, in the interests of each other, pool their resources, appoint a directorate or management committee to have a personal oversight of various interests on the property. Every member of the company shall be employed in its service, and shall receive a salary sufficient to meet his living expenses, and shall also share in the profits of the company. I admit that this is revolutionary as applied to farming, but we must face the fact that some such method is being applied in almost every sphere of business to-day to enable it to carry on. Revolutionary methods in business are not necessarily destructive, and oftentimes successful, and that is all we seek—the most successful method of farming. This is a method by which the good is secured for the greater number and threatens to eliminate the wealthy farmer, who has become wealthy often through the happy combination of good soil, a fair rainfall, and common sense. We think his gifts more valuable when shared by the community. Would this be a disadvantage? A district is not made prosperous by a select number of wealthy men, but by a larger number of contented farmers having security of tenure, stability of markets, and congenial social life. Over capitalisation is a general cause of loss in farming operations. An ordinary farm of, say, 1,200 acres has two or three thousand pounds' worth of machinery to produce its income. I would suggest an area for experiment equal to that held by, say, a dozen men in this neighborhood—about 15,000 acres of land, varying in quality. I venture to say that the capital needed in such a co-operative venture would immediately be reduced by at least one-half, and at once this could be put into profitable ventures, such as poultry for export, dairying, cattle raising, refrigeration, &c., all of which could be carried out to greater advantage under these circumstances. Labor would be a mere detail—that is, that everybody would be available for busy seasons. The mechanical part of the business could be attended to by an expert; in fact, everywhere there would be scope for the specialist, working under the best conditions. All know what a charge to the community the unsuccessful farmer is—the man who fails. Often his failure is not the result of laziness, but either of lack of capital through weather conditions, or because of inaptitude for business. Under such a scheme as suggested this good man would find his true sphere of work, or could sell out to someone more efficient than himself. There can be no room for misfits in farming or in any other business. Another advantage would be the establishment of a reserve fund against unstable prices or dry years and for replacement in machinery. Such methods of farming would result in greatly reduced freight, or a more economical method of carrying goods. The social advantage of such a scheme would be well worthy of consideration. There need not be the isolation common to the farming community, the levels of social enjoyment would be greatly raised, and how desirable that is, folks who live comparatively lonely lives can say. The whole world is changing; whether it is for good or for ill, depends upon how we adjust ourselves to the changes and face life in the spirit of the adventurer who is not afraid of what to-morrow may bring forth.'' *Discussion.*—Mr. Cooper said co-operation had its advantages and disadvantages. It was impracticable in farming. He was in favor of individualism. Mr. Story said most farms were over-capitalised, and that had a lot to do with the position of farmers to-day. Under co-operation it would be possible to cut down expenses. He had followed the advice given by the Poultry Expert with regard to the feeding of fowls for egg production. The first consignments of eggs he sent away only 30 per cent. were fit for export, whereas since he had improved on his methods of feeding it had risen to 80 per cent. being suitable for export. Mr. Rehn said under co-operation there would always have to be a head, the minority having to submit to managers. There were inefficient farmers in every district. The drought had brought ruin to many. Easy money was not in the best interests of farmers. The elaborate credit system was the ruin of Australia. Individuality was the best for the State and nation. Mr. G. Wake said co-operation would benefit by being able to get cheaper implements. To be successful one required to have up-to-date machinery. He had been handicapped when he first started farming in having to use obsolete implements, but since he was in a position to buy up-to-date implements he had been successful. Mr. Payne said every industry was organised with the exception of farming. Farmers were a most difficulty body to organise. The Wheat Pool had done more for farmers than any other movement. The Canadian Wheat Pool was vastly different to the South Australian Wheat Pool; the former was a speculator which stored its grain in bins, whereas the later sold all its wheat within 12 months. There was no over-production of wheat in the world. All that was on hand at present would be consumed in six weeks if all the countries ceased producing. (Secretary, W. J. Cooper.)

GREEN PATCH (Average annual rainfall, 26.56in.).

November 10th.—Present: 11 members.

Meeting held at Mr. T. Murray's homestead. In a discussion on subterranean clover, Mr. A. Schwerdt stated that livestock did not care for it overmuch, and that horses would not eat it if other fodders were available. Other members quite disagreed with this statement. At the invitation of Mr. Murray an inspection was then made of a grass paddock in which 10 horses were grazing. In this paddock there was an excellent growth of grasses and clovers—much native clover, hop, custard, and other clovers, including subterranean. Every horse in the paddock was eating subterranean clover. (Secretary, C. Whillas, Port Lincoln.)

KAPINNIE.

November 18th.—Present: Nine members and six visitors.

Field Day and Crop Inspection.—The first crop inspected was that of Mr. A. Green, who showed 120 acres of Currawa. These were on the lake banks and promised to yield 8 to 9 bags per acre. 100lbs. of super were used. From here the party travelled to the crop of Mr. O. Green, who also had crop on lake banks, from which a fairly good yield is expected. The varieties seen were Currawa, Gallipoli, and Dan, and the amount of super used was 90lbs. per acre. One field on this property was badly affected by take-all. Mr. J. Doudle had a nice crop of Currawa on new land fallow. Amount of super, 90lbs. per acre. Mr. H. Ashman's crops of Currawa and Gallipoli on new land fallow and dressed with 90lbs. super per acre gave indications of a fair yield. Mr. A. Green then showed, on the property of the late Mr. D. Ness, a crop on stubble land which should yield about 10bush. per acre. The party then journeyed to the farm of Mr. R. L. Myers and farmed by Mr. R. Schulz. The varieties seen were Currawa, Gluyas, Queen Fan, and Kurley's Early, which should return about 4 bags per acre. 100lbs. super were used. One field showed effects of take-all rather badly. On the farm of Mr. R. Kain, managed by Mr. C. Luckraft, crops were seen of Currawa, Kurley's Early, Onas, and Nabawa. 90lbs. super used. Take-all showed badly in places. The next crops inspected were on the farm of Mr. J. H. Lawrence (chairman), the varieties being Gallipoli and Nabawa, and the amount of super used was 90lbs. per acre. Take-all had made its appearance and had affected the yield considerably. A large paddock of well-worked fallow on this property was favorably commented on by the visitors. The last place of call was the homestead of Mr. O. Green. This farm 5 years ago was scrub and now is free from shoots and is a waving field of grass. (Secretary, A. Giles.)

LAURA BAY.

November 8th.—Present: 20 members and eight visitors.

The judges, Messrs. J. Low, J. Spry, and A. Dixon, announced the following results of the local Crop Competition:—(First) W. L. Edson, 75 points; R. Sims, 67; C. Collins, 66; B. Hoffrichter, 63; A. Bowell, 57; C. and A. Lowe (two entries), 54 and 51 points. (Secretary, W. Edson, Ceduna.)

ROBERTS AND VERRAN.

September 14th.—Present: 12 members.

THE AGRICULTURAL BUREAU.—Mr. J. Payne, in reading a paper on this subject, gave an outline of the history and progress of the Agricultural Bureau since its foundation in 1887. Continuing, the paper read as follows:—"Members could make the work of Branches more interesting by attending regularly and being willing to write a paper for one of the monthly meetings. Members can lighten the duties of the secretary by the regular payment of the annual subscription and by introducing new members. I also suggest that two meetings during the year should take the form of debates with the Cleve or Taragoro Branches, and that the annual meeting of the Branch take the form of a social gathering. One of the Agricultural Instructors could be invited to give an address, and with musical items, followed by a supper and a dance, it would be a good advertisement for young members for the Branch."

A formal meeting was held on October 12th. (Secretary, C. Masters.)

November 9th.—Present: Nine members.

HARVESTER *v.* STRIPPER.—Mr. H. Smith read the following paper:—"The cost of the harvester is greater than the stripper and also the wear and tear, but one has also to consider getting off the crop and labor saving. The harvester is not the quicker for gathering the wheat; one cannot travel so fast on average ground in this district, and time is lost in oiling. On the other hand, bags can be sewn and carted when a cool change comes. Where the land is fairly clean, free from stumps, &c., the harvester can be worked satisfactorily by one man, but where new land is being cleared and the crops are under 8bush. and 9bush., a harvester would be worked at loss. Also, more horses are needed for working a harvester. The cost of purchase and upkeep of the stripper is much lighter; in taking off the crops it is quicker than the harvester, is the better machine for rough ground and light crops, and there is not the danger of breakages. With the stripper, the wheat has to be cleaned and a hand or motor winnower used for this purpose, for which a man would have to be employed for a few weeks, which would nearly bring the cost, &c., up to the harvester." Discussing the paper, Mr. V. Jonas agreed with the writer that the harvester was expensive in the new country where the ground would be rough and generally crops were light. Mr. S. Barber favored the stripper. Our crops were too uncertain to warrant a harvester. The upkeep on a harvester was more than on a stripper and winnower. More horses were required to work a harvester, especially in sandy ground. Mr. H. Mahar said a harvester was cheaper, one man doing in one operation what it took two to do with a stripper, thereby saving wages again. Wheat could be sown and carted on a cold damp morning when the man with stripper would clean wheat. Again there was a saving of time which was in favor of the harvester. Mr. R. Paxton considered if a man was working a farm single handed he would only crop a small area, which would be about 300 acres, and would be put in on well worked fallow, which should return a yield which would be suitable for working a harvester, and one man could handle the crop. If poor crops were experienced the stripper was preferred. Mr. F. Masters said with a harvester, reaping could not be done in the mornings as early as with a stripper. Wheat was put over the tail of machine when tough, besides losing ground. Bad weather conditions caused more damage to wheat and bags than was the case with a stripper. To overcome the wages problem, he advocated two or three farmers having a winnower between them and helping one another—reducing cost. Again in lean years cocky chaff was of some value if stored carefully, and the stripper had that to its credit. He had found that the wide stripper for a single-hand farmer was the cheapest. Mr. C. Masters favored the use of the wide stripper in this locality where soil conditions changed rapidly, being lighter to pull, covering a larger area in a day, and reaping earlier. (Secretary, C. Masters.)

TARAGORO.

November 10th.—Present: 10 members.

CARE OF HORSES.—Paper by Mr. O. Guy:—"A stone stable covered with iron is best for both winter and summer. If the roof is thatched it is very dangerous, because in summer a fire is very easily started, and if horses are closed in and a fire starts, they are almost certain to be injured. The team should be fed as regularly as possible to keep them fit for work. Only feed as much as the horse can eat for each meal. They should be fed four times a day when working, and have a drink three times a day in summer and twice a day in winter. If they do not drink much, add salt to the feed to make them thirsty. The trough should be cleaned out often, dirty troughs carry red worms and many diseases. Groom each worker every morning, especially the shoulders; dirty shoulders are the cause of many sore shoulders. See that the collars fit snugly; a loose collar will soon rub a sore. The hames, too, are very often the cause of sores, the hame hooks should be placed just about the centre of the collar. Rubbing chains are generally caused by narrow swings or having big links near the middle of the chain. After unharnessing the team at night wash the shoulders with cold water.'' Discussing the paper, Mr. A. Crabb said to keep tar and treacle handy and place some occasionally on horses' tongues to prevent strangles. Other members suggested.—False collars of sheepskin to prevent sore shoulders, or an old rubber motor tube for same purpose. Rubbing boracic acid on shoulders; a mixture of tar and kerosene as a preventive of bot flies; and salts in water and bran mash over the week end to keep blood clean were other suggestions. A visitor stated the horses should be fed four times a day always, with good feed, the feeders cleaned out regularly, and that patience and kindness would do much to keep the team strong and healthy. (Secretary, T. Winters, Cleve.)

WALLALA.

October 4th.—Present: 14 members.

MIXED FARMING.—Paper read by Mr. H. Schultz:—''Under the climatic conditions of this district wheatgrowing alone does not show enough profit to cope with expenses and interest on debts. It is necessary for a farmer of this district to have at least 150 to 200 sheep, 3 to 5 good milking cows, and about 100 fowls, in addition to the area under crop. Sheep, cows, and fowls greatly reduce living expenses, which are very great in the case of large families. It costs practically nothing to support sheep, cows, or fowls. The former live on natural grasses and bushes, whilst the latter can live on wheat unfit for sale. The money which is accumulated during good years will soon become scarce during bad years if one depends on wheat alone. The first substantial sideline should be 150 to 200 sheep, which any farm in the district can support. Last year, when the price of wool was practically the lowest on record, £50 or £60 could be obtained from the number of sheep previously stated. Furthermore, the sheep provide the house with meat, and the flock is essential on fallow to destroy weeds, pack and fertilize land. It may be difficult to purchase sheep when money is scarce, but a few good sheep can be obtained, and by breeding and from the proceeds of wool more sheep purchased each year. The next profitable sideline is dairying. From 4 or 5 cows at least 5galls. of cream could be had for sale each week. By sending it to Lincoln at least 15s. per week can be realised. The freight on a can of cream from Ceduna to Lincoln is approximately 2s. 10d. If 4 or 5 farmers were to co-operate, and each keep enough cows to fill a 5gall. can of cream per week, and one farmer with a truck was to convey all the cream to Wirrulla, charging perhaps 2s. per can; and 5galls. of cream produced on an average £1 per week, minus 2s. and 2s. 10d., the producer would still clear approximately 15s. 2d. per week, plus the reduction of the cost of living. This sideline must not interfere with cropping activities, otherwise it will not be profitable. Children over 10 years should be quite capable of milking cows and doing the bulk of

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the work in connection with cream production. The next lucrative sideline would be the keeping of about 100 or more fowls. These should lay on an average through the year at least 3½doz. eggs per day, leaving for sale about 17doz. per week. A few weeks ago most of the local stores were offering 4d. per dozen for eggs, whereas 9s. per dozen could be cleared by sending them to Port Lincoln. At this price the annual income from the sale of 17doz. eggs per week would be approximately £33 3s., plus the reduction of the cost of living. These sidelines have been calculated on low market prices; but even then the total income from sheep, cows, and fowls would be approximately £123 3s. per annum, plus a marked reduction in living expenses. Before these sidelines can be profitably put into operation, good fences and a convenient water supply are absolutely essential. Until such time as a water service is available it is necessary for the farmer to build tanks. The only materials required are cement and a wire for a fence. The lime can be burned, the tank covered with brush and mallee timber, and enclosed with fencing, and it is quite safe and reliable. As to the cost of cement and labor, it may not be possible to finance the purchase of the former, but can one afford to waste the time of going for a load of water every few days, as well as the cost of fuel or wear and tear of the trolley? By building tanks expense will have to be incurred, but it will come back in an indirect form, and in a few years the tank will pay for itself, especially when mixed farming operations are conducted. Good fences are also essential to control the livestock and to practise the necessary crop rotation. Improvements in the form of tanks and good fences, not only prepare for a better annual income, but add value to the property.''

A further meeting was held on November 9th, when 10 members attended. Mr. W. Baldock gave a report on the Adelaide Congress, and Mr. W. H. Brownrigg spoke on wheat growing and crop rotation. (Secretary, C. Tippell.)

Other Report Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Mangalo	29/8/32	19	"Sheep on the Farm," R. Turner	K. Nield

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

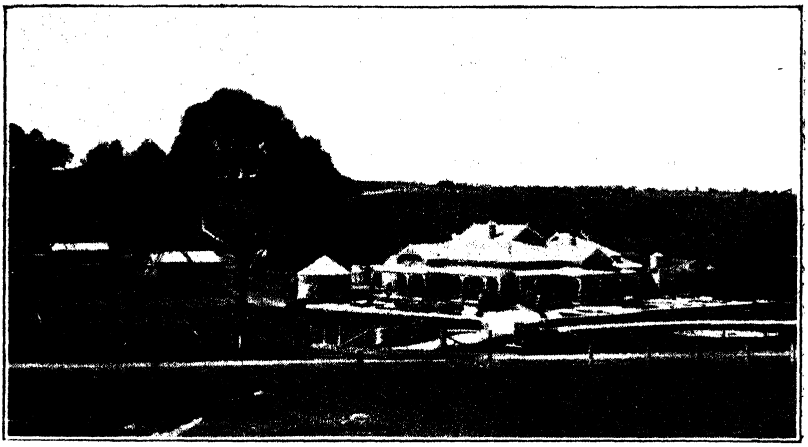
KULKAWIRRA (Average annual rainfall, 14.34in.).

November 8th.—Present: 10 members.

THE GAS PRODUCER TRACTOR.—The following paper, relating his experiences with a gas producer tractor, was read by Mr. A. Elliot:—''We have not found the gas as satisfactory as we expected from the point of view of power production, the relative power developed by the engine compared with kerosene being very much lower. With kerosene the tractor pulled a 21-tine cultivator, 14-disc plough, or 12 leaves of harrows, doing this work satisfactorily on top gear at three miles per hour. On gas the tractor would only pull eight leaves of harrows on top gear, 10-disc plough in bottom gear with a little petrol to help on heavy sand hills. The engine runs perfectly on gas only for lack of power. The producer gas plant takes more skill in handling to get the best results from the engine than liquid fuel. The relative cost of working the tractor on producer gas and kerosene is as follows:—For nine-hour day, 18galls. of kerosene, doing 80 or 90 acres with 12-leaf set of harrows, producer gas, on eight-leaf set of harrows, doing from 35 to 40 acres per day, using approximately five well filled butts of charcoal at a cost in time to burn 16 butts, half day, to seive and fill into bags two hours. That is using only one small kiln for burning, but if two or more kilns were used, one man could look after and burn three or four kilns at the same time, thus saving a lot of time. Very little more petrol is used in starting than when using kerosene. Oil lasts twice as long with kerosene; the oil keeps its color very much better, there being no dilution; 12galls. of water is used per day. The gas is made by passing air and steam through a bed of red hot carbonaceous fuel. This gas is explosive when mixed with a certain proportion of air. The gas must be delivered to the engine as cool, clean, and dry as possible. Three scrubbers are used; the water scrubber takes out the ash and grit, the oil scrubber removes wood tar and water vapor, and the dry scrubber of sea sponges dries the gas thoroughly, with special intake manifold to keep the gas cool. We found it of great advantage to keep the engine

in

heads very hot (about 180 deg.), using a blind infront of the radiator for this purpose with a motor metre for guide. We have a good success in burning charcoal, using a small kiln 3ft. wide, 3ft. 6in. deep, and 6ft. long. In burning, we start the fire well all over the bottom of the kiln, then add about an 18in. layer of stumps, burn until the mass is all red, then add about 2ft. more of stumps, allowing these again to burn well through then add more stumps until about 2ft. above ground. When this burns to ground level it should be all red hot charcoal. Then cover tightly, using two sheets of iron, covering the edges and join with earth until quite airtight. Leave closed for two days to allow fire to go completely out. This has always given good charcoal, fairly fine so long as not too much burnt, but it must be well seived before using to take out sand, grit, ashes, &c. From a kiln of this size 16 well filled tied bags or butts will be obtainable. There is some danger of letting the fire burn too long without attention, leading to a waste of material and over-burned charcoal. The small kiln is preferable to a larger one for convenience in covering.'' (Secretary, H. Elliot.)



House and Outbuildings on Mr. J. G. R. Wachtel's property, south of Palmer.

RAMCO.

October 19th.—Present: Seven members.

THE CITRUS INDUSTRY.—Mr. C. Boehm, in the course of a paper on this subject, said most growers were aware that the citrus industry was passing through a critical period, but there were still some who did not realise this fact and were the cause of the chaotic conditions of the citrus market. The nett returns of the last several seasons should convince every grower that cut throat marketing is unprofitable. Such practices might be satisfactory to the individual while production was below demand, but when this point had been reached and passed then the reverse action took place. When production was below demand, the producer could demand a price, but when the position was reversed the buyer dictated the price. It was the duty of every grower to co-operate to offer and sell his products through organised channels. Besides some leading producers there were citrus growers with a few trees to an acre or two who were indifferent to anything that was done for the benefit of the industry. They looked upon their few trees more as a side line, and took no further interest in the industry, or in the association, and generally sold their fruit to the first buyer that came along. Those small growers, and there were quite a number of them, were an obstacle to the Citrus Association. With the ever increase in production it became vital to the industry to have some method of regulation, and if growers would not submit to voluntary regulation, then the only alternative was compulsory control. This last appeared inevitable if the industry was to survive; at least it would place all citrus growers on an equal footing and do away with cut-throat marketing. When control was introduced it would have to be without any loopholes to be of any benefit to the industry. With control would come the end of private packs, for control would not be complete without shed or central packing. With shed packs considerable improvement could be made with selling and account sales. The shed should be the seller of the fruit, the agents could obtain their requirements from the shed, and return account sales to the shed once a week in one cheque, the shed then making payment to the grower or to his bank. It would not be necessary for the agent to have the growers' names, but each grower would have a number on the case, known only to the shed and growers. For Ramco he suggested a revision of numbers, for instance, drop all the A's, but keep the B's, and start the numbers from 1. They would then read B1, B2, &c., Waikerie would read C1, C2, and every district in a like manner. The agents would account for each number sold to the shed and the shed to the individual grower or his bank. Discussing the paper members agreed that it was well thought out. Many things were contributing to present trouble, not the least being the present low purchasing power of the public. It was also considered that previous export efforts were practically wasted owing to lack of keeping up of continuity of market. Export would be necessary, and practically all ground work had to be done again. (Secretary, J. Odgers.)

SOUTH AND HILLS DISTRICT

BLACKWOOD.

October 10th.—Present: 14 members and seven visitors.

Research Work on Fruit Diseases.—The following points are taken from an address delivered by Mr. G. Samuel, M.Sc. (Waite Research Institute).—Mr. Samuel suggested that future progress would be in the direction of more detailed work rather than in any epoch-making discoveries. Dealing with black spot of apples, the lecturer told members that its life was divided into two cycles—a summer one on the leaves, twigs, and fruit, and a winter form, in which it was to be found breaking down the dead apple leaves on the ground. The summer stage of the fungus was known as Fusiculadium. From the months of August to December the winter stage of the fungus in the dead leaves on the ground was discharging its spores, but only in wet weather. The spores were shot up into the air and distributed by the wind into any neighboring apple tree, where they would germinate. As a method of control, it was advocated that orchards should be ploughed before the end of August to cover over dead leaves. Subsequent cultivation should be carefully carried out to avoid turning the leaves up to the surface again. A delayed dormant spray would protect early leaves. The summer spores were also found to be liberated in wet or moist weather, and in all cases the ideal was to have the spray on the tree before the spores got there. Bordeaux spray was undoubtedly the best control and a spray programme should start with Bordeaux and be followed with lime sulphur. By using hydrated lime, Bordeaux spray lost the disadvantage resulting from the difficulty of procuring good lime, and could then be prepared as easily as Burgundy, over which it showed considerable superiority. When using hydrated lime the formula for winter use was 5-4-40 and 3-4-50 for summer. Ordinary skim milk made an excellent spreader if mixed in the proportions of 1gall. of milk to 100 of spray with 2ozs. of lime added. If the milk was sour the lime should be increased to 8ozs. A more effective spreader, which gave maximum results, was one made to Needham's formula containing resin, potash, and fish oil or other animal oil. Dealing with sulphur sprays for fungus diseases Mr. Samuel said that colloidal sulphur outclassed any other form of sulphur; it's adherence was so great that it still gave a good protective coating when all other forms had been washed off. That was accounted for by the extremely fine particles it was composed of, the particles being about one-tenth to one-hundredth the size of the particles of ground sulphur. In the case of lime sulphur, recent investigation had shown that the active agent was the polysulphide contained in it, and that the specific gravity was not a reliable indication of its value. Fungi such as silver leaf and *Polystictus* entered through pruning cuts or large wounds. It was advisable to cut out dead wood in the summer, for wounds healed quickest then, and to paint all large cuts with white lead paint or Bordeaux powder made into a paste with linseed oil. These preparations kept out the fungus effectively. (Secretary, H. K. Goldsack.)

CHERRY GARDENS (Average annual rainfall, 35.03in.).

December 17th.

Seventeen members and a number of visitors, including delegates from the Blackwood Branch and several ladies, attended the December meeting, which was held at the residence of Messrs. H. R. Stone and Sons. The following points of interest were noted:

Apples were carrying a fair crop, the trees being very healthy; strawberries had yielded good crops of excellent quality; the subterranean clover plots had given very fine cuts; all stock were in first class condition. Afternoon tea was provided by Mrs. Stone.

HARTLEY (Average annual rainfall, 15in. to 16in.).
November 9th.—Present: 14 members.

SEED WHEAT.—Mr. C. Brook read the following paper:—"A man who does not save his own seed is a poor farmer. By saving his own seed he will be sowing seed that has become acclimatised, because generally such seed gives the best return. If changing to another variety, sow only a small area, unless the variety has been grown on similar soil and climate. By sowing a small quantity it can be hand-picked before harvest and made true to type. A good plan to obtain pure seed is to cut the quantity estimated for seed into strips when cutting hay and then hand-picking strip No. 1 quite clean, go to the next strip and do likewise. If for any reason hand-picking cannot be finished there will be at least some strips clean. It is much easier to pick a narrow strip than a wide one. Always pick if possible facing towards the sun. Harvesting seed is best done with the stripper and hand winnower, because it is almost impossible to thoroughly clean the harvester or reaper thresher. All seed should be well graded. If grading a large kernel variety, keep only the largest grains for seed. If a small kernel variety do not use the large grains, because when hand-picking, if any heads of a larger kernel variety are missed the grains from those heads will be found in the largest sample. It is advisable to run the large sample off and sow the second sample. Before changing to grade another variety take all sieves and screens out and thoroughly clean them. The inferior grain can be used for feeding to pigs, poultry, &c. Seed should, if possible, be put in new bags, but if secondhand bags are used they should always be turned and cleaned before re-filling. All seed should be dry pickled if there is no smut in it, but wet pickled with formalin or bluestone if at all smutty. Use less graded seed per acre than seed that has not been graded. A good way to obtain pure seed, although slow, is to go through the crop and pick the largest true to type heads and thrash and sow the grain from them in a plot. This will not only give pure seed, but the crop return will be very much better. After the crop is true to type, one can select the largest heads and mix the seed obtained with the seed for the main crop. Horses or cattle running on stubble, unless the crop has been of the same variety, should not be allowed to go on the fallow, because they may pick up grain in the stubble and carry it to the fallow. The same should apply on pasture if cropped the previous year—a few heads of wheat or barley are often noticed in these paddocks."

CARE OF HORSES' SHOULDERS AND HARNESS.—Mr. H. Phillips read the following paper at the October meeting:—"First see that the collars fit the horses; if a sore is noticed on one of the horses knock the collar in that spot with a bottle or a stick, which will relieve the draft off the sore; also alter the hames so that the chains are not pulling in a direct line with the sore. Do not allow too long a period to elapse before having the collars relined, so that they are soft to the shoulder. Give the leather part of the collars an occasional dressing of oil mixed with fat rendered down; if this is put on the collars twice a year it will keep out rain in winter and the sun will not dry them up so much in summer. Select good pipe collars so that they can be buckled up without any danger of the horses choking. When horses are fat do not buckle the collars as tight as when they are poor. One of the best treatments for sore shoulders is to soak wattle bark in a kerosene tin of water, and immediately the horses are unharnessed rub this liquid on the shoulder, which will harden the sore. Another good plan is to smear a little grease over the sore, which will help it to heal without a very hard scab. It is important to see that the swings are a fair width. The swings in the centre of the team should lap slightly so that the team is not working at too much of an angle. This does not apply at harvesting; all that can be done in the harvest is to keep the team as straight as possible. Do not use split links that will rub the horses; if a slight rub is noticed it may be caused by a narrow collar. Cut out a piece of motor tyre, put two holes in it the width apart of the hame hook and fasten to the hook so that it will not come out while turning. See all harness is kept in good repair; a few rivets will help to do this."

Mr. H. Brook read the following paper:—"The Dairying Industry in this District." "*Profitability.*—Feed plays a very important part in successful dairying. A small amount of dry chaff mixed with plenty of green lucerne makes a good ration for cows. Always keep on hand a good supply of feed to tide over the summer. If dairying is to be done profitably, a close market for our produce and the growing of the bulk of the feed are necessary. Cows should have plenty of shelter for summer and winter. Good clean water in clean surroundings is essential. Keep the right breed of cattle. *The Dairy.*—Build the dairy on a rise so that all water, &c., runs away. Have sheds and yards as open as possible to let in sunlight and kill germs. The sheds must be ventilated and built in such a way as to keep out dust. Plenty of water should be available to clean sheds. Keep away from other places, such as stables and pigsties, because cream taints. *Construction.*—Have the roof high, to let in air. The floor must be on a slope to allow for drainage. Have a clean approach. Have the bails strong, but not heavily made, and as simple as possible. *Care of Dairy.*—Clean up as often as possible and keep away all vermin, *i.e.*, rats, cats, &c., because they are disease carriers. *Milk.*—The parts of milk are—water 87 per cent., proteins which are casein and albumen 3 per cent., butter-fat 3.5 per cent., milk sugar 4.8 per cent., mineral matter .7 per cent. The butter-fat is not dissolved in the milk, but consists of small particles scattered throughout the milk. The fat is the lightest substance, therefore it rises. Casein causes the whiteness in the milk. *Butter-fat.*—This varies according to the breed of cows. Feed plays an important part in the test of cows. During milking the butter-fat is increased, *e.g.*, a cow gives 2galls. of 4 per cent. milk; 1gall. is 2 per cent., ½gall. 3.5 per cent., ½gall. 6 per cent. *Care of Products.*—Keep all milk and cream in a cool place to check germs, but provide ventilation to keep the cream fresh. *Testing.*—The amount of milk taken is 18grms 17.6cc. The test is read from top to bottom of column. Sulphuric acid acts on all parts of milk except fat. The Jersey is a fat producer, sometimes giving up to 7 per cent., the average being about 5 per cent. The Ayrshire is not a fine boned animal, but the cows are good milk and butter-fat producers—4 per cent. average. The Friesians are the best milk producers, with a lower test—3.5-4 per cent. average. The Shorthorn is a dual purpose breed, *i.e.*, milk and beef. *Calves.*—Every dairyman should raise the calves to improve the herd—it is more economical. Best food for these is warm skim milk with grain afterwards if preferred. The calf should run on the cow for at least 4 days after calving. This nearly always obviates mammitis and milk fever. Do not over-feed calves; it causes stunting and scouring. Calves must be sheltered to grow quickly. Cows do best if they are milked at regular intervals and at the same times each day. The milk is made during the interval between milkings and is transported to the udder through the blood veins. When buying a cow, always look to the udder to see if these veins are prominent; if so she is most likely to be a good milker.'' (Secretary, D. C. Harvey.)

LANGHORNE'S CREEK (Average annual rainfall, 14.76in.).

November 9th.

This meeting took the form of a Field Day at the residence of the president, Mr. H. Follett. Fifteen members and 14 visitors attended, including high school boys from Strathalbyn. The party first visited the currant vines, where Mr. Follett explained the methods he adopted in their cultivation; thence through the orchard of mixed fruits and almonds. Going through a paddock of natural pasture carrying several varieties of grasses and clovers, three Jersey cows were seen which are under test. Three small lucerne paddocks were then inspected which were carrying a growth of canary and other grasses, which is to be cut for hay. Finishing through the orangery back to the house, afternoon tea was provided, during which Mr. C. H. Beaumont gave an address on almond growing. (Secretary, P. Nurse.)

MILANG (Average annual rainfall, 14.92in.).

November 12th.—Present: 15 members.

Mr. E. E. Newell (district clerk) gave an address on fire control. A practical demonstration was given with a water fire extinguisher to the members and a number are going to purchase one of them.

Mr. Bowden gave an address, ''Most Suitable Pig for Bacon.'' The first breed dealt with was the Essex; this breed was discarded because it was too fat and of little use as a baconer. The Large White x Tamworth took too much feed, but when topped up made a fine dressed article. The Poland-China x Berkshire showed the best profit, but was inclined to put on too much fat. The Duroc-Jersey had no length, so he advised crossing it with a Tamworth. The speaker said that the Berkshire seemed to predominate wherever bacon rearing was practised. Often a farmer would drop this breed for some other, but usually he had to introduce Berkshire blood in some form or other. The cross that was thought best to use was a Berkshire sow and a Tamworth boar. In this cross one got the length of the sire and the Berkshire characteristics, such as a bacon producer. The feeding of a pig, said Mr. Bowden, was the main factor in producing good, clean, choice bacon, and the following method was mentioned as being most suitable:—Skim milk with the addition of pollard was essential. Then soak whole grain for two days and then add a percentage of skim milk. Malting barley could be prepared in this manner and be ready for use in two or three days. Cape barley could be treated likewise, but took a longer period to ferment after the milk had been added. Mr. A. Kelly said he had been breeding Large Whites and had been well satisfied with his results. Mr. J. Yelland said his experience with this breed had been very disappointing, as the mortality was heavy in the early stages of rearing. Mr. B. Casley thought the Tamworth was a good sire, and also favored the Large White. (Secretary, L. Yelland.)

MYPONGA (Average annual rainfall, 29.48in.).

November 19th.

The November meeting took the form of a Field Day, and was attended by 10 members and 18 visitors, including Messrs. R. Hill and Drs. Davidson and Davies, of the Waite Institute. The properties of Messrs. K. and C. Rowley, R. West, B. Kronmark, and J. Muller were inspected.

A special meeting was held on November 29th, when Mr. C. Goddard, of the School of Mines, gave a wool classing demonstration.

Myponga Agricultural Bureau Field Day. Members are photographed in front of a crop of Horse Beans on Mr. Muller's property.

BUTTER, AND SOME OF THE PROBLEMS IT PRESENTS TO THE MANUFACTURER.

Paper read by Mr. B. Graetz at the October meeting of the Springton Branch.

Early History.—The art or knowledge of butter-making dates back 2,000 years B.C., and reference to the use of butter as an article of food and for medicinal purposes may be found chronicled long before the Christian Era. The fundamental principle in making butter is to subject the milk or cream to such treatment as to cause the minute fat globules to unite, forming butter granules. This is accomplished by concussion, produced by vigorous agitation at the proper temperature, and that is what we term churning. The ancient people made butter in the stationary type of churn. The milk was placed in earthen vessels and given a twirling motion, either by beating it with the hands or by stirring it with a stick, terminating at its lower end in a butt or other primitive contrivance. The Arabs and Hebrews made a sort of bag out of animal pelts, filled them half-full with milk, sewed them up, and then manipulated by swinging and kneading until butter formed. Since then, of course, all sorts of contrivances have been in use, and right up to and including mechanical perfections of the twentieth century churn, all and every one had to be based on the old fundamental types of intensified concussion.

In the early times butter was employed in many ways. The Hindoos used it for the greatest and holiest sacrifices in their worship. The Greeks and Romans did not use butter as a food, but as a standard remedy for injuries to the skin. The soot of burned butter was regarded as a specific remedy for sore eyes. The Romans also used it as an ointment to enrich the skin and as a dressing for the hair. Historians speak of butter used as a remedy for wounded elephants, and within a century butter was used in large quantities in Scotland and North of England for smearing sheep, also as an oil for lamps. In Spain as late as the Seventeenth Century butter was to be found in the medicine shops for external use only. In rural districts in Germany at the present time fresh unsalted butter is much used as a cooling salve for burns. Aside from its use as a food and medicine, the use or possession of butter was long regarded as indicating wealth, and so served to distinguish the rich from the poor people. Evidences of this still exist. In both Chilas and Darel a practice exists of storing up butter underground. Butter so stored is left a number of years, and to insure its not being disturbed a tree may be planted over it. Under these conditions it turns a deep red and is highly prized. The owners' wealth is computed by the quantity of butter he has stored up in this manner. Butter was enjoyed as a food by comparatively few people in its early history. Those who did so use it seldom ate it fresh.

During the middle ages the making and the use of butter in the Old World gradually increased, but the primitive equipment and methods available, and the absence of the helping hand of science, precluded rapid strides in the development of this now great industry.

Up to the middle of the Nineteenth Century the factory system of butter-making was practically unknown, and both in this country and abroad, butter-making was confined to the farm dairy. From that time on, however, the manner of butter-making underwent marked changes. Slowly at first, and more rapidly as the advantages of volume production became more and more appreciated. This trend toward the making of butter on a large scale suggested the urgent need of more suitable equipment and improved methods, the introduction of which, in turn, gave added advantages to the change from farm butter-making to factory production. The advent of the farm hand-separator gradually revolutionised the butter-making industry. With the beginning of the factory system of butter-making the urgent need of a method to determine the per cent. of butterfat in milk and cream became more and more apparent, in order to enable the factories to pay the farmer on the basis of the butterfat in milk and cream.

In 1890 Dr. Babcock, chemist at the Wisconsin Agricultural Experiment Station, invented what is now known as the Babcock test, and the introduction of this method of testing has been proved to be of incalculable value to our butter industry, as well as to the dairy industry in general. It made it possible for the factories to pay the dairyman on the basis of the true butterfat value of his milk and cream. It also enabled the producer to test the milk of his cows, and thus find out the butterfat production of the individual cows in his herd. It also assisted the food authorities in protecting the consumer against adulterated milk.

The testing operations are of vital importance, both to the factory and the supplier, and every operation from taking the sample, weighing, and testing, must be carried out with the greatest accuracy, otherwise the whole job is useless, and the results would be very soon apparent. If by careless weighing the tests are too high, there will be a considerable loss to the factory. If made too low, the factory will again be the loser—it will lose its suppliers. The weighing, grading, and testing of cream, are the three operations in which a cream supplier's interests are involved. Whatever happens after that stage does not affect the supplier. Now it would be a very simple matter for the cream tester to always have the supplier smiling, by always giving a little more than he is entitled to, if it was not for the churn results, which always tell the tale. Should he try to favor the supplier, he gets into trouble with the butter-maker; if he favors the manufacturer, the supplier is dissatisfied, and the only way to avoid trouble is to arrive at the actual content of the butterfat, and hereby do justice to both parties. The testing of cream really takes more labor and time than does the actual making of the butter, and if cream tests did not vary, large expenses could be saved to the factory. But there are so many factors that are attributable to the variations of the test that it is only on very rare occasions that there is not a variation in the test. Therefore every can must be tested. Some of the causes of variations may be:—

1. Where some cows are drying off and fresh cows coming in. In this case the tendency is toward a drop in the cream test. Addition to or taking out of the herd of cows producing high or low testing milk will have a similar effect. It will raise or lower the cream test respectively.

2. Iregularities in the operation of the separator will always cause variations in the fat test. High speed, small rate of milk inflow, and low temperature of milk increase the test and produce less pounds of cream. The more water and skim milk that is used for flushing the bowl, the lower the fat test.

3. Having cream standing in a number of dishes with large openings will increase the test, but a corresponding shrinkage in volume. It does not increase nor alter the pound of fat in the total. There appears to prevail among cream producers the erroneous belief that sour cream yields a higher fat test than the same cream when sweet. This belief has led to the deplorable practice of holding the cream on the farm longer than necessary, and under temperature conditions favoring rapid souring, and causing serious depreciation in quality, due to fermentation, &c. Dairy experts have made investigations to the effect that souring cream has on the test, and carried out various experiments which demonstrated conclusively that the souring of cream does not increase the fat test. By holding the cream in order to sour it, it causes simultaneous evaporation of moisture from the cream, thereby increasing the fat test. Without such evaporation there is, and can be, no increase in the fat test. The increase in the fat test, when it occurs, is directly proportional to the loss of weight in pounds in cream. The increase in the test, therefore, does not alter the pounds of fat for which the farmer is paid. The amount of fat in the can remains constant. Sour cream contains no more fat than sweet cream. While nothing is gained by souring the cream on the farm, much may be lost.

There are, of course, many other causes why cream tests vary. Faulty separators, &c., and it is nearly always through these causes that complaints and dissatisfaction arises between manufacturer and supplier. A bad separator and bad cows are the biggest enemies to the butter manufacturer, because he is often blamed for the something that in reality the faulty separator or the bad cows are responsible for.

Quality of Cream.—Another problem is second grade cream. Poor quality cream means inferior butter. The farmer loses by it. The factory loses by it and the consumer loses by it. Unfortunately, few suppliers ever taste their cream, consequently very rarely discover when their cream is sick. It arrives at the factory and must be graded, and it is the grader's unpleasant duty to mark it second grade. Well he knows the supplier will be dissatisfied, but it cannot be helped, because it is not possible to return the properties of bad cream to the original state of good, fresh cream. Butter made from inferior cream sells at a loss, and the cream it was made from must be paid accordingly.

These are only a few of a butter manufacturer's troubles, just dealing with the cream itself. Very many more arise, when it comes to the stage of making the butter, and finding a market for the same. (Secretary, E. Brokate.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Monarto South .	19/11/32	27	" Farm Machinery," A. R. Strauss	C. Altmann
Hope Forest . . .	5/12/32	14	Address—C. H. Beaumont	E. Muldoon
Finniss	12/11/32	—	" Marketing Produce," M. Llewellyn	M. Meyer
Hindmarsh Is. . .	19/12/32	70	Xmas Party	H. Newell
Mt. Compass . .	1/12/32	75	Lantern Lecture—H. Hall	C. Verco
Blackheath	15/12/32	5	Paper from *Journal*	E. Paech
Jervois	8/12/32	25	Lantern Lecture, P. Manuel	T. Baily
Macclesfield . . .	15/12/32	15	Address—C. H. Beaumont	H. Ross
Shoal Bay	10/1/33	6	Discussion	E. Bell
Langhorne's Creek	11/1/33	6	Discussion	P. Nurse
Blackheath	19/1/33	7	Paper from *Journal*	E. Paech
Balhannah	28/10/32	16	Visit to Lenswood A.B. .	C. Grasby
Balhannah	9/12/32	16	Discussion	C. Grasby
Kangarilla	30/11/32	30	Visit to Victor Harbor . .	T. Golder
Blackwood	12/12/32	11	Address—C. H. Beaumont	H. Goldsack
Mt. Compass . .	21/1/33	30	Papers by M. Howard and H. Pitt, of Ashbourne	C. Verco
Scott's Bottom .	13/1/33	6	" Seed Potatoes," Mitchell	E. Atkinson, Cherry Gardens

CROWN LANDS.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. Richards, Commissioner of Crown Lands.

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All communications to be addressed:

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S. R. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

South-East, at Bordertown (Tatiara Branch), Wednesday, April 5th. (Secretary, Mr. L. H. Butler, Bordertown.)

Dairying.—At Mount Barker, Thursday, May 11th (Secretary, Mr. P. Wise).

River Murray, at Berri, Thursday, June 15th. (Secretary, Mr. E. J. R. Johnson.)

Each Conference will be opened at 10.30 a.m.

Brown Rot of Apricots.

In reply to a recent question on Brown Rot of Apricots, Mr. Geo. Quinn (Chief Horticultural Instructor) stated that there was some doubt as to whether the "brown rot" referred to was the disease due to one of the species of the fungus *Sclerotinia* (*Monilia*) or to the brown decay which developed near to the stone in some of the ripening apricot fruits. According to Dr. Wormald, of Britain, and other writers, the brown rot fungi consisted of several species of *Sclerotinia*. The principal one in Britain was distinct from that so prevalent in America, and to a lesser extent in Australia. The species found in Victoria, and to a much lesser extent in this State, was said to be *Sclerotinia fructicola* of Winter. It was reported by McAlpine as *Sclerotinia fructigena* many years ago as being found in this State, but it was not recorded again here until found last year at Payneham, from whence it was brought in by Mr. N. R. Quinn. The first appearance of the disease was as a tiny brown speck that rapidly developed into a large spot, beneath which the flesh was deeply invaded. If heat and moisture conditions were available the rot development rapidly increased. It was a solid type of rot, not soft and watery as with *Penicillium* (blue mould) injuries. Spore cushions appear on the surface of the rotted area frequently within 24 hours. These turned into ashen grey masses of *Conidia*, which were often grouped in concentric rings over the rotten spot. The fruits often adhered to the trees, drying slowly, and shrivelling into a mummy. The blossoms were attacked and turned brown and died. These also adhered to the twigs often through a season. They were covered with masses of *Conidia*, which disappeared in dry weather, but recur again after rains. Twig cankers sometimes arose from the spurs or twigs becoming affected. The leaves adjacent often became affected and brown, but these were not deemed so important. The affected leaves of the peach took on a water-soaked appearance and were often covered with conidial masses. Leaves blistered by curl leaf fungus were stated to be peculiarly susceptible. The optimum temperature for growth of the fungus was between 70° and 80° Fahr. Temperatures over 90° and dry atmospheres were distinctly unfavorable. It grew slowly at temperatures not much above 32° Fahr. Birds and insects and the wind were the chief means of distribution of the spores. The harvesting of fruit also spread it by means of the pickers' hands. The mummified fruits were a serious source of spreading the disease, either from the tree or soil. The control of the disease was best obtained by the use of fungicides. In the U.S.A. good results had been achieved by spraying about four weeks after the petals fell, using lime sulphur, and again about a month before ripening time. Dusting with finely ground sulphur was also used, as it could be safely applied nearer to the ripening time of the fruit. The Americans, according to the most recent Technical Bulletin, No. 328, by Roberts & Dunegan, on "Peach Brown Rot," used a self-boiled lime sulphur made by blending 8lbs. of sulphur with 8lbs. of quick lime and adding water to set up action, which when completed was increased to make 50galls. of spray. This fungus attacked plums of all sorts very freely, as well as peaches and apricots, and had been recorded on apples, cherries, pears, rose, blackcap berry (*Rubus occidentalis*) and blackberries. The disease has been fully discussed in the *Journal of Agriculture* of Victoria during recent years.

Registration of Stallions.

Replying to the Secretary of the Overland Corner Branch of the Agricultural Bureau, who asked if it was compulsory to register stallions, the Chief Inspector of Stock (Mr. C. A. Loxton, B.V.Sc.) stated:—"The Draught Stallions Act was passed by Parliament last session. As soon as the Act is proclaimed it will be necessary to register all draught stallions two years old and over. All draught stallions except those in possession of Government certificates issued for life or those which are used only for the service of mares which are the exclusive and sole property of the owner of the draught stallion must also be submitted for examination for soundness. The Act applies to those portions of the State within the hundreds, but provision is made to reduce or extend the area. Applications for registration and examination must be made to the Chief Veterinary Officer, Stock and Brands Department, Adelaide. Regulations are in course of preparation, and it is anticipated that the Act will come into force on July 1st, 1933."

Entry of Australian Wheat into Great Britain Free of Duty.

In November last, certain queries were raised by the grain trade as to the exact conditions which must be complied with to enable Australian wheat to be accorded free entry into the United Kingdom as provided under the Ottawa Agreements. It was feared that British Customs requirements in regard to proof of origin might seriously hamper normal trading in Australian wheat overseas.

In this connection it was mentioned that vessels frequently sail from Australia "for orders," the ultimate destination of the wheat being determined by orders received *en route*. Further, a wheat cargo might be bought, while afloat, by a foreign buyer and resold by him to a British buyer, the cargo being diverted on the original vessel to the United Kingdom. The Secretary of the Department of Commerce (Mr. E. J. Mulvaney) states that in consequence of the uncertainty as to the requirements of the British Authorities, the Federal Government had taken steps, through the Australian Resident Minister in London, to urge that the British Customs should grant free entry of Australian wheat sold to the United Kingdom, provided that it was not landed in a foreign country prior to reaching the United Kingdom.

BARLEY

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Subsequently advice was received that the British customs regarded goods shipped on an optional bill of lading to the United Kingdom from any part of the British Empire as having fulfilled the conditions required, provided that the goods actually reach the United Kingdom without removal from the original ship on which they were loaded at the Empire port. If goods are transhipped or landed at a foreign port, the necessary conditions are not fulfilled, and the wheat concerned would not be granted free entry. All parcels of wheat must be accompanied by certificates of origin on Form 119, which would not be rejected by the British Authorities merely because the quantities shown thereon were in excess of quantities landed. (This provides for cases where a portion of a cargo on an optional bill of lading to Great Britain is sold and landed in a foreign country *en route*). The decision referred to also applies to all Empire goods eligible for preference, *e.g.*, citrus fruits.

The Sheep Blowfly Problem.

A comprehensive report on all aspects of the sheep blowfly problem has just been issued by the Council for Scientific and Industrial Research and the New South Wales Department of Agriculture acting in conjunction.

For some time past both these bodies have been investigating different phases of the problem, and a year or so ago they established a joint committee consisting of Dr. J. A. Gilruth (Chairman), Dr. R. J. Tillyard, Dr. H. R. Seddon, and Mr. W. B. Gurney, with Dr. I. M. Mackerras as Secretary to co-ordinate the work of the two bodies, and to advise generally in regard to the initiation of new investigations into other aspects of the main problem. One of the first actions of the committee was to prepare the above-mentioned report.

The report itself was edited by Drs. H. R. Seddon and R. J. Tillyard. It is written in simple language and comprises 136 pages of subject matter, together with a number of text figures of larvae, traps, &c., a number of photographs of interest, and a colored frontispiece showing each individual species of blowfly associated with strike. By reference to this colored frontispiece and to the accompanying descriptions, it will be possible for anyone to determine the nature and importance of any blowfly which he may capture.

The various sections of the report deal with such matters as primary, secondary, and tertiary flies, factors influencing fly abundance, the susceptibility of individual sheep, crutching, jetting, swabbing, dipping, dressings, breeding to reduce susceptibility, fold removal operation, biological control, trapping, and carcass treatment as well as a number of other matters of importance in the control of the pest.

The report summarises and discusses all known methods of prevention and treatment of fly strike—a condition which is probably the most serious affliction with which the Australian pastoralist has to contend, and one which in bad years costs Australia upwards of £4,000,000 per annum.

The publication is being issued as Pamphlet No. 37 of the Council and Science Bulletin No. 40 of the Department. Copies, price 1s. 6d., post free, are available on application either to the Council (314, Albert Street, East Melbourne) or to the Department of Agriculture, Box 36A, G.P.O., Sydney).

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publications:—

"Official Year Book, Commonwealth of Australia, 1932." Commonwealth Bureau of Census and Statistics.

"Pasture Book, 1933-4." Messrs. F. H. Brunning Pty. Ltd., Melbourne.

VETERINARY INQUIRIES.

[*Replies supplied by Veterinary Officers of the Stock and Brands Department.*]

"Rockleigh" reports foal, three months old, with large swelling in stifle.

Reply—Clip the hair over the swelling and paint the skin daily with tinct. iodine. If this tends to produce blistering effects after a few applications, discontinue its use until the symptoms subside, when the applications can be repeated. The swelling should gradually disappear, though it may be a matter of three or four weeks, or even longer.

"Yandiah" reports two-year-old Jersey heifer with yellow headed pimples on teats.

Reply—Give an occasional dose of Epsom salts, ½lb.; combined with ginger, 4 tablespoons; treacle, 1 cupful; to keep bowels relaxed. Swab rash with warm boracic solution twice daily, and when dry, anoint with carbolized vaseline. Do not milk wet, use vaseline.

"Allandale East" asks will rape cause red-water in cattle.

Reply—Red water (*Enzootic haematuria*) of cattle, so far as South Australia is concerned, is confined to a certain restricted area around Mount Gambier. The disease was investigated by the Council for Scientific and Industrial Research of the Commonwealth, but the cause of the disease was not discovered. Rape will not cause red-water.

"Yurgo" reports cow punctured with a wheat tester after being gorged with wheat. Wound will not heal.

Reply—Very little can now be done for the cow. Dress wound two or three times daily with tr. iodine or following dressing:—Creosote, 1 part; oil of turpentine, 6 parts; raw linseed oil, 20 parts. Put clean sacking over wound to prevent irritation by flies. Give cow 1 teaspoonful of powdered nux vomica three times daily for four or five days.

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FERTILISERS AND SOIL AMENDMENTS.

By W. J. Spafford, Deputy Director of Agriculture.

(*Continued from page* 815.)

PHOSPHORIC ACID.

But few soils in the world contain much phosphoric acid, and Australian soils are notably deficient in this plant food, and the scanty supply of available phosphoric acid is soon used up when regular cropping is undertaken. In consequence the making good of the shortage of phosphoric acid by applications of phosphatic fertilisers is found to be necessary fairly soon after our soils have been brought under the plough. A full supply of phosphoric acid in the soil plays a special part by stimulating early root development and promoting general vigor in plants in the early stages of growth, by tending to counteract any tendency to excessive rankness, by promoting early maturity, and by tending to the development of flowers and seed rather than leaf and stem. Phosphoric acid is commonly found in the world in combination with lime, and it is nearly always as a form of calcium phosphate that it is used as a fertiliser.

Because of the special conditions applying in cold wet countries, nitrogenous manures are probably the most important of the artificial manures, but in all hot, dry countries, including our own, phosphatic manures are generally the only ones that have any permanent value. In a climate similar to ours potash is given up to plants so readily from the soil, that potassic manures are not necessary, and the supply of nitrogen is dependent upon the good mechanical condition of the soil and an adequate supply of organic matter, rather than on applications of expensive nitrogenous fertilisers, but with phosphates it is quite otherwise. The actual soil stock of phosphoric acid is so slight, and the store is not naturally renewed from outside sources, so the success of general agricultural operations is very largely dependent upon an abundant supply of concentrated artificial phosphatic manures. That this is so in South Australia can be readily realised by a glance at the following table, wherein are set out the phosphatic manures used in the State since 1900, the figures for every fifth year being shown :—

Table VIII.—*Artificial Manures Used on Crops in South Australia.**

Year.	Total Area Cropped.	Area Manured.	Percentage Manured.	Quantity Used.	Average per Acre.
	Acres.	Acres.	%	Tons.	Lbs.
1900-1	2,369,680	648,284	27·35	20,259†	70·0†
1905-6	2,255,569	1,488,946	66·01	49,853†	75·0†
1910-11	2,746,334	2,217,404	80·74	81.899	82·7
1915-16	3,763,570	3,099,536	82·36	98,258	71·0
1920-21	3,231,083	2,781,930	86·10	101,474	81·7
1925-26	3,583,867	3,195,861	89·17	130,217	91·3
1926-27	3,883,919	3,533,868	90·99	146,910	93·1
1927-28	4,192,166	3,815,419	91·01	157,183	92·3
1928-29	4,660,002	4,251,348	91·23	171,965	90·6
1929-30	4,966,916	4,606,210	92·74	181,045	88·0

* These figures include artificial manures other than phosphatic manures, but the quantity is very small. In 1927-28 we imported 38 tons of potash salts, 560 tons nitrate of soda, and 1 ton sulphate of ammonia, and manufactured in the State about 1,100 tons sulphate of ammonia.

† Estimates, because only the area manured was collected before 1907-8.

These figures show how quickly the farmers of the State realised the value of phosphatic manures for crops. The increase in the percentage manured to total area cropped from 27·35 per cent. in 1900 to 80·74 per cent. in 1910 was phenomenal, and since that time there has been a steady and regular increase in this percentage figure. The quantity of manure used per acre has varied somewhat, but each time there has been a drop, it has been during a period of drought when the money returns of farmers were reduced because of small crops.

It is gratifying to recollect that both the introduction of these manures, and the rapid extension of their use over the cropped portions of the State is the direct result of work done at the Roseworthy Agricultural College. It was the first Principal of the College—Professor J. D. Custance—who, in the early eighties, drew attention to the efficacy of phosphatic manures, after he had seen the results following their use in experimental plots laid down by him ; whilst his successor—Professor Lowrie—did more than anyone else towards popularising their use over the length and breadth of the State.

EARLY USE OF PHOSPHATIC MANURES.

The first distinctly phosphatic manure to be used was in the form of bones Unbroken bones were thrown on the land and rolled in, but it was soon realised that better results were secured when the bones were broken. This operation was done very roughly and relatively large pieces were broadcasted, still, even here, much better distribution of the material was possible. After gradually learning to grind the bones finer and finer it was eventually found possible to convert them into a fine powder known as bone flour, in which form it is still a popular phosphatic fertiliser.

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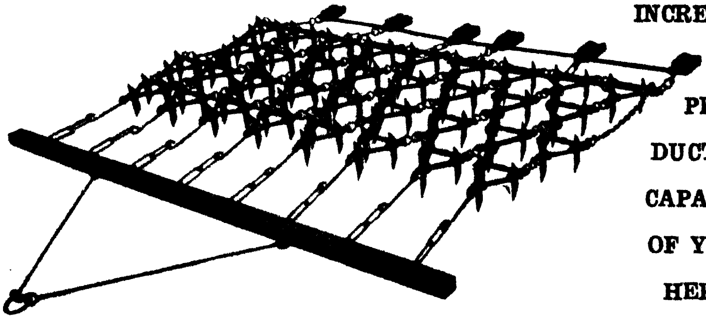

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In the beginning of the nineteenth century bonedust was being used in Germany, and by 1920 it was being fairly extensively used in England. So striking were the results obtained that the demand could not be kept pace with from home supplies, and the continent of Europe was ransacked for further supplies, and the catacombs of Sicily and the battlefields of Leipsic, Waterloo, and the Crimea were not overlooked. At about this time animal charcoal (charred bones) which was used for decolorising and purifying sugar-beet syrup, came very largely into use in France as a new form of manure. Again the demand outran local supplies, and the world was searched for its available stocks.

At this time the reason for the effectiveness of these bone manures was not known. It was customary to consider the benefit derived from the use of bonedust and animal charcoal to be due to the nitrogen they contained or to the gelatine. In 1843, however, the Duke of Richmond undertook a definite series of experiments on the subject, and succeeded in proving definitely that these manures were effective mainly because of the calcium phosphate they contained. This discovery was of immense importance, as it widened, almost immeasurably, the available supplies of these manures. Deposits of natural phosphates were known to exist in different parts of the world, notably in England and France, which would now be available as a supply of phosphatic manures. It was assumed that in all probability more extensive deposits might be found in other parts of the world, which proved to be so, and new deposits of almost inexhaustible dimensions were discovered in North and South America, India, North Africa, Russia, and some of the Pacific Islands.

EXISTING SOURCES OF PHOSPHATIC MANURES.

Phosphates suitable for use as fertilisers are to be secured in the form of raw rock phosphates, bones, and basic slag, and although the known resources are by no means inexhaustible, there are enormous quantities in sight which will fulfil agricultural requirements for a very long time.

RAW ROCK PHOSPHATES.

Deposits of rock phosphate are found in several parts of the world, where the phosphoric acid is usually combined with calcium, and to a lesser extent with aluminium, and it is from the former—the calcium phosphate—that the great bulk of superphosphate is manufactured.

The available rock phosphates vary considerably in character from hard, dense crystalline rock to soft friable stone, and even loose phosphatic sand. Their origin varies according to circumstances; in some cases they represent the result of direct crystallisation of calcium phosphate from ordinary eruptive rocks (apatite); in others they must be ascribed to the decomposition and fossilisation of animal and plant residues; and finally in more modern deposits to the accumulation of animal residues as guano.

The bulk of these rock phosphates is in combination with calcium in a very insoluble and stable form, and of a richness varying up to close on 90 per cent. of calcium phosphate, equal to about 40 per cent. of phosphoric acid.

Until comparatively recently but little of these mineral phosphates was used as fertilisers without treatment to change the form of phosphate, and the results secured when untreated raw rock phosphates were used were poor in most cases. It is now known, however, that provided the raw rock phosphates are finely ground they make really good phosphatic manures for some conditions. It is a matter of common knowledge that the use of superphosphate on sour soils does not reduce their acidity, and it is in these soils that finely-ground raw rock phosphate is a suitable phosphatic fertiliser. As a general rule it can be taken that finely-ground raw rock phosphate can be used to advantage in sour soils, in peaty soils, where rainfall is heavy, and where irrigation is practised. To make its use economical, it should be so finely ground that 60 per cent. will pass through a sieve with 100 meshes to the inch. Where nitrogen as well as phosphoric acid is to be supplied, sulphate of ammonia and finely-ground raw rock phosphate make a good mixture for the purpose, and the interaction between the two materials liberates the phosphoric acid more quickly than would otherwise be the case.

On the results secured at Kybybolite Experimental Farm, it appears that finely-ground aluminium phosphate is quite equal to fine-ground calcium phosphate, at all events for top dressing pastures.

The great bulk of the raw rock phosphate which comes into this country is imported with the object of converting it into superphosphate, and very little is used in the untreated state. This is not so in countries with heavier rainfall than we receive, and our near neighbour, New Zealand, uses quite an appreciable proportion of the imported raw rock phosphate, after grinding it into a fine powder, but without other treatment.

The present evidence is that the mineral rock phosphate acts best on permanen grass in moist districts with a long growing season, and is less effective on arable land and on grassland in drier regions. Much experimental work is being done in various countries with this form of phosphatic manure, and the results emphasise the wide difference between various crops in their powers of assimilating phosphorus from mineral phosphate. The groups are approximately :—

Considerable Power.	Less Power.	Little or no Power.
Lucerne (best)	Vetch	Wheat
Lupin	Beans	Oats
Mustard	Winter Rye	Barley
Hemp		Rye
Cabbage		Maize
Rape		Carrot
Swedes		Tobacco
Turnips		Millet
Buckwheat		Clover
Peas		Tomatoes
		Potatoes

Nearly all of the rock phosphate handled in Australia comes from Nauru and Ocean Islands, and is of first-class quality for conversion into superphosphate. The island of Nauru, which was owned by Germany before 1914, was mandated to Great Britain, but in 1919 Great Britain, Australia, and New Zealand arranged a combined control and an Administrator was chosen. The island, which is situated in long. 166°E., is 26 miles south of the equator, has a circumference of about 12 miles, an area of 5,400 acres, and has a climate which is not unpleasant although hot. About four-fifths of the island is phosphate-bearing. Ocean Island is situated about 165 miles east of Nauru. The quantity of phosphate on these two islands is estimated at not less than 100,000,000 tons, and as shipped it contains 85 per cent. to 88 per cent. tri-basic phosphate of lime. The deposits are worked by the British Phosphate Commission of three members, one appointed by each Government, and the three countries are to receive the output in the proportions of 42, 42, and 16. At the present time Great Britain is not taking phosphate from these deposits ; all that is mined going to Australia and New Zealand.

The imports of raw rock phosphate into Australia of recent years is shown in the next table.

TABLE IX.—*Raw Rock Phosphate Imported into Australia.*

	From Nauru and Ocean Islands.	Total Imported.
	Tons	Tons
1925-26	313,482	323,187
1926-27	463,726	508,588
1927-28	377,435	461,006
1928-29	433,729	617,485
1929-30	373,293	528,955
Means	392,333	487,844

PHOSPHATE DEPOSITED AMONGST CORAL.

At Nauru and Ocean Islands, from whence comes the great bulk of the phosphatic rock used in the manufacture of superphosphate in Australasia, the phosphates are found intermingled with a considerable amount of coral. The illustration shows, in the foreground, the columns of coral still standing after the phosphates have been removed, and in the background, an area prepared by the clearing off of the over-lie, for the mining of the phosphates.

Before 1914 considerable quantities of superphosphate were imported into Australia, but at present practically none of this fertiliser is brought in, and our requirements are manufactured in the country from the imported raw rock phosphate.

BONES.

Bones have been an important source of phosphorus for manurial purposes, and until comparatively recently they were the sole source of supply of this valuable substance and had been so for centuries. Raw bones contain just below 50 per cent of calcium phosphate, about 34 per cent. of organic matter, and about 10 per cent. water, the remainder consisting of small quantities of other salts. The organic matter of the bones contains nitrogen to the extent of 2 per cent. to 4 per cent. of the weight of the bones.

Bones are rarely used as a manure in the raw state, because it is impossible to grind them sufficiently fine for best results. There is a great waste of valuable materials in the bones, and the presence of fat retards the splitting up of bones when in the soil. There is now no demand for a bone meal with many ¼in. pieces or even larger, but finely ground bones are readily purchased. To enable the fine grinding of the bones it is necessary to remove most of the fat and some of the gelatine, but the removal of this latter substance lowers the nitrogen content of the final product. The bones are steamed or boiled under pressure to remove the fat, which is used for soap making. In some places the fat is removed more thoroughly with benzine. These treated bones contain 40 per cent. to 50 per cent. of calcium phosphate, and 3 per cent. to 5 per cent. of nitrogen, and can be then converted into bone meal, but cannot be broken to a fine powder. After the fat is extracted the bones are broken up and steamed at a much higher temperature and pressure, when glue is produced and separated out. The bones now contain only about 1½ per cent. of nitrogen, but something approaching 60 per cent. of calcium phosphate. The removal of the cartilage enables the bones to be ground to a really fine powder, known as bone flour, and is in good condition for distributing as manure.

ROOFING OVER PHOSPHATE DEPOSITS.

So that there will be no delay any time in the year in collecting the phosphatic rock at Nauru, considerable areas are roofed over after the over-lie has been removed, and then mining operations can be continued throughout the rainy season.

The calcium phosphate in bones is in an insoluble form, and if it is to become available to plants within a reasonable time after being put into the soil it must be ground into a fine powder. The mechanical condition of fineness does not affect the composition, but increases the availability of the plant food, hence the finer the grinding of the bones the more valuable as a quick-acting fertiliser.

Bone flour is a good phosphatic manure for intense culture, and particularly in light soils poor in lime, such as sands and gravels.

Although bone manures are good phosphatic manures, the user generally pays dearly for his fertiliser, because the price per unit of fertilising material is much higher than can be obtained in other forms of phosphatic manures. The demand for ground bone is greater than the supply, and appears to be due to the prejudice in favor of this form of fertiliser, which has been handed down for ages by crop growers. For such a long time, bone manures in some form were known by crop growers to lead to greatly increased returns, that they cannot forget it, and despite the increased knowledge of plant requirements, and the discovery of various fertilisers to supply the deficiencies of plant foods, many users of phosphatic manures still pin their faith to bonedust, no matter what the price to be paid for it.

BONE BLACK.

Bone black, or bone charcoal, is used for decolorising and clarifying of sugar. After it has served its purpose it is sold as a fertiliser. It is made from choice bones, which are distilled in vessels until only bone charcoal remains, which, when coarsely ground, is ready for use. Although the spent bone black contains about 60 per cent. of calcium phosphate, and about 0·5 per cent. nitrogen, it is too slow-acting to be a popular fertiliser.

BONE ASH.

At one time bone ash was a better known phosphatic manure than at present, but nowadays there is only a little on the World's markets, which is sent from South America in that form to save freight. All the nitrogen has been destroyed in burning, but good samples contain over 75 per cent. calcium phosphate.

BASIC SLAG.

Basic slag is obtained in the conversion to steel of cast iron containing phosphorus by combining the phosphorus with lime, when the iron is in the molten state. The resulting slag contains from 12 per cent. to 23 per cent. of phosphoric acid, and after cooling and removal from the furnaces is finely ground. Basic slag comes into the market as a dense black powder, so finely ground that four-fifths of it will pass through a sieve having 100 meshes to the inch, and besides the phosphoric acid, it contains from 5 per cent. to 20 per cent. of free lime.

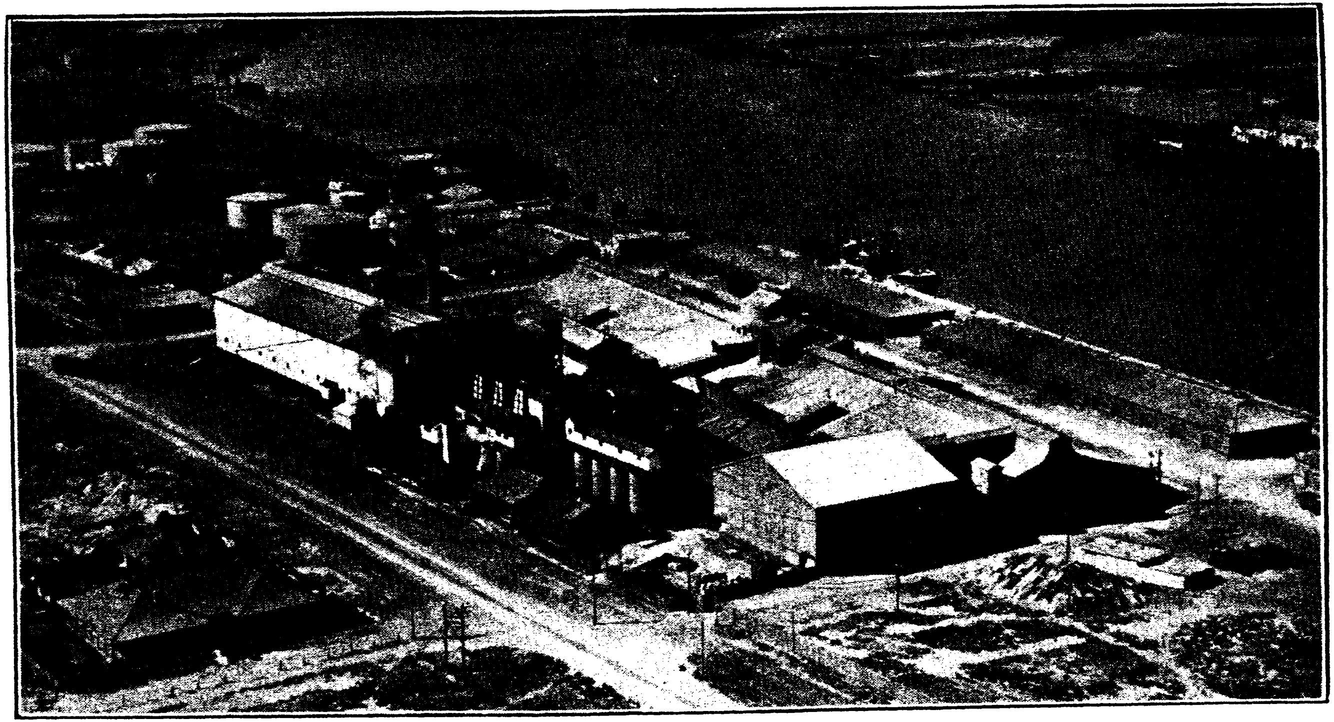
This fertiliser is a good form in which to apply phosphoric acid to clayey soils where there is heavy rainfall, or where irrigation water is applied. Basic slag is used very extensively in Europe, particularly for the improvement of pastures, and in many places it gives the most economical results of all forms of manuring when used for this purpose.

Although the phosphoric acid in basic slag is not so quickly available as in superphosphate, it is all collected by plants fairly soon, and the lime present does much good to the soil. In England it is found to be worth a little less per unit of calcium phosphate than is superphosphate, but in some cases it has special benefits which make it slightly more valuable.

No basic slag is manufactured in Australia, and the freight charges are so high for the European material that it has no chance of competing with other forms of phosphatic fertilisers, and more particularly with superphosphate.

SUPERPHOSPHATE.

Superphosphate is manufactured by treating insoluble calcium phosphates, either mineral or organic, with sulphuric acid, when the great bulk of the insoluble phosphate is made soluble in water. It is rarely made from raw bones, because the organic matter interferes with the action of the acid, but mineral phosphates are largely used, and sometimes bone ash and steamed bones.



SUPERPHOSPHATE MANUFACTORY.

The superphosphate used in South Australia is manufactured in the State from phosphatic rock imported from Nauru and Ocean Islands, and sulphuric acid is also made here. The works required for the making of the acid and then the fertiliser are of necessity fairly extensive, as can be seen by the illustration, which depicts one of several which operate in South Australia.

In the manufacture of superphosphate, the raw rock phosphate, or bone product, is finely ground, and mixed with sufficient dilute sulphuric acid, containing about 60 per cent of pure acid, to bring about the following reaction :—

$$Ca_3P_2O_8 + 2H_2SO_4 + 4H_2O = CaH_4P_2O_8 + 2CaSO_4,\ 2H_2O.$$

An excess of sulphuric acid must be employed to convert other substances present into sulphates, and as this means a waste of acid, search is always made for mineral phosphates containing as little as possible of materials, other than calcium phosphate, likely to be acted upon by the acid.

The mixing is performed mechanically, a considerable rise in temperature takes place, and there is an evolution of water vapor and other gases. After mixing, the hot damp mass is dropped into a lower chamber, where the reaction completes itself, and the whole solidifies as the gypsum combines with the remaining water. The mass is friable, and is dug out, crushed, and put in store. At one time artificial drying had to be employed in order to obtain a really dry product that would run easily through a drill, but all necessity for that process has passed away since high-grade phosphates containing but little iron or alumina have been available. The more gypsum the finished superphosphate contains, the more friable the powder, and so natural rock phosphates containing calcium carbonate as the principal impurity are the most valuable for conversion to superphosphate.

In calculating the amount of sulphuric acid to use, a little calcium phosphate is always left undecomposed, because free phosphoric and sulphuric acids would injure the mechanical condition of the fertiliser. This phosphate of lime left unattacked will always slowly combine with some of the acid phosphate to form the intermediate di-calcium phosphate, which is then known as *reverted phosphate*—

$$CaH_4P_2O_8 + Ca_3P_2O_8 = 2Ca_2H_2P_2O_8.$$

Since di-calcium phosphate is insoluble in water, freshly-made superphosphate always contains a little more phosphoric acid soluble in water than it does after it has been stored for some time.

The changes from mineral phosphate to superphosphate, and then partly back again to the reverted di-calcium phosphate can be easily realised when shown in this form—

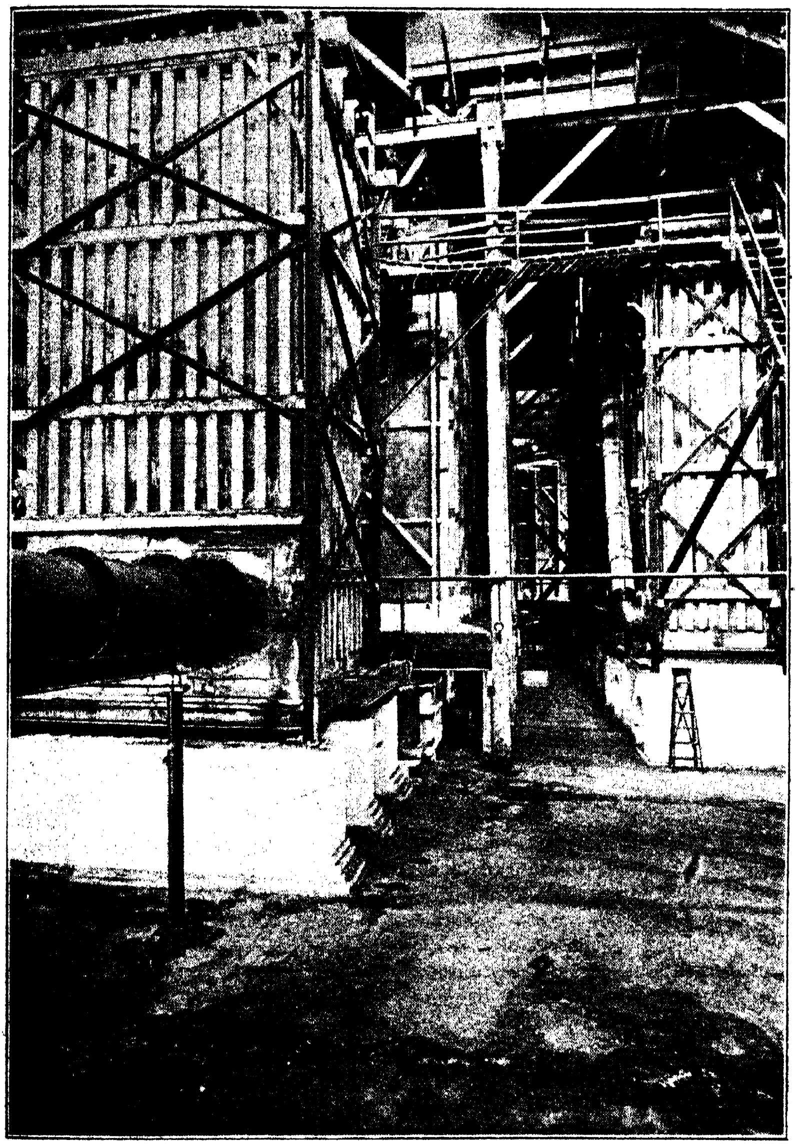
$$\text{Tri-calcium phosphate} \left\{\begin{array}{l}\text{Lime}\ \ldots\ldots\ldots\\ \text{Lime}\ \ldots\ldots\ldots\\ \text{Lime}\ \ldots\ldots\ldots\end{array}\right\} \text{Phosphoric Acid}$$

$$\text{Mono-calcium phosphate} = \left\{\begin{array}{l}\text{Lime}\ \ldots\ldots\ldots\\ \text{Water}\ \ldots\ldots\ldots\\ \text{Water}\ \ldots\ldots\ldots\end{array}\right\} \text{Phosphoric Acid}$$

$$\text{Di-calcium phosphate} = \left\{\begin{array}{l}\text{Lime}\ \ldots\ldots\ldots\\ \text{Lime}\ \ldots\ldots\ldots\\ \text{Water}\ \ldots\ldots\ldots\end{array}\right\} \text{Phosphoric Acid}$$

Superphosphate as made to-day is a greyish-colored friable powder or granular mass, which remains dry and is readily distributed by the ordinary seed drill. The various grades on our market are what are known as 36 per cent., 45 per cent., or 48 per cent. water-soluble phosphate, but more correctly the term means the percentage of tri-calcium phosphate converted into mono-calcium phosphate. In some other States of the Commonwealth the various grades are shown by the amount of phosphoric acid (P_2O_5) they contain, and if this method was followed in this State our ordinary grades would show as 16½ per cent., 20½ per cent., and 22 per cent. of phosphoric acid.

Besides the ordinary grades of superphosphate a very concentrated form of water-soluble phosphatic manure known as Double Superphosphate or 100 per cent. Superphosphate is being manufactured. Phosphates are treated with an



MANUFACTURING SULPHURIC ACID.

An enormous amount of sulphuric acid is required for the making of superphosphate, and practically all that is used here for the purpose is made in the State by the fertiliser companies. The buildings and plant necessary for the manufacturing of the acid are really extensive, as can be seen in the illustration, where one corner is shown of a sulphuric acid-producing plant operated in a South Australian fertiliser works.

excess of sulphuric acid, when free phosphoric acid is formed. The liquid part of the mixture, which consists of phosphoric and sulphuric acids, is separated from the insoluble matter and concentrated The concentrated liquid is used to treat high grade phosphates and the resulting fertiliser contains from two to three times as much phosphoric acid as does ordinary superphosphate. This form of superphosphate is expensive, but is sometimes economical because of the saving in freight and bags.

Importance of Superphosphate.

The amount of phosphoric acid used for fertilising crops is enormous, and superphosphate is easily the most important form in which it is applied. In 1928 the estimated world's consumption of superphosphate was 15,000,000 tons, which contained 69 per cent. of the total phosphoric acid used in the world. The quantities of the principal phosphatic fertilisers, and the phosphoric acid supplied, are shown for 1928 as—

TABLE X.—*World's Consumption of Phosphoric Acid (P_2O_5) in 1928.**

Fertiliser.	Quantity.	(P_2O_5) Content (approx.).	Quantity P_2O_5.	Per Cent. of Total.
	Tons.	%	Tons.	%
Superphosphate	15,000,198	17·4	2,612,010	69·0
Basic Slag	5,330,000	16·0	852,800	22·0
Ground Rock Phosphate	400,000	28·5	114,000	3·0
Phosphate Rock in Nitrophoska, Ammonium Phosphate, and similar products	200,000	28·5	57,000	1·5
Phosphate Rock in Rhenania and similar products	117,000	28·5	33,346	0·9
Guano	180,000	13·0	23,400	0·6
Bone Fertiliser	350,000	30·0	105,000	3·0
			3,797,556	100·0

* Sir E. J. Russell in "Agricultural Research in 1929."

The Uses of Superphosphates.

On practically all normal soils superphosphate is the most effective phosphatic fertiliser when equal amounts of phosphoric acid are compared, but for the full benefit to be received from applications of this fertiliser, the soil should contain an excess of lime, or rather calcium carbonate. Where sufficient lime is not present, some of the phosphoric acid might combine with iron and aluminium, forming unavailable phosphates, and if so, much of the phosphoric acid may be lost to the plants it is proposed to benefit. The soils in which superphosphate does not give full beneficial effects are light sands and gravels deficient in lime, peaty soils containing sour humus, and sour soils generally. The effectiveness of this form of phosphatic fertiliser seems to be due to the fact that because of its solubility when put into the soil, even though it reverts very quickly, it is deposited in a very fine state of division throughout the soil in the neighborhood of the roots of plants. Superphosphate has a wonderful effect in promoting rapid root development, and so is particularly valuable for shallow-rooted plants, and short-lived crops which have to grow quickly.

NEW PHOSPHATIC FERTILISERS.

Nothing so sensational as the synthetic nitrogen developments has occurred in connection with phosphatic fertilisers, still manufacturers have not been idle. Much experimental work is being done to find out if a more economical way of utilising insoluble phosphates can be found, so as to replace the practice of converting these phosphates into superphosphate by the sulphuric acid treatment. Wherever sulphuric acid can be easily and cheaply obtained its use has proved the cheapest known method, but other countries are trying different means. The most promising of the treatments consist of :—

1. The ground rock phosphate is treated so as to increase its solubility in citric acid. Near Hamburg in Germany a manure known as Rhenania phosphate is being made by heating a mixture of raw rock phosphate, limestone, and a potassium silicate such as phenolite, to a temperature of 1,200° to 1,300° C. after which its phosphate is almost entirely soluble in 2 per cent. citric acid, though none is water soluble. It has not become popular, even in Germany, and at present shows no signs of seriously competing with superphosphate.

2. In some places the mineral phosphate is being made into a compost with organic matter, or sulphur or both, the conditions being arranged so that micro-organisms can produce acids which will dissolve the phosphate. The process is slow, and unsuited for large scale operations. It has attracted some attention in the United States of America, and is being considered in parts of Russia as a method of working up local phosphatic deposits in regions where organic matter is much cheaper than sulphuric acid.

3. A method of treating the raw rock phosphates which appears very promising, and one which might lead to the replacement of some superphosphate, consists in decomposing the phosphates in an electric furnace so that the phosphorus is burnt to form phosphoric acid, which is then combined with synthetic ammonia to form ammonium phosphate. The ammonium phosphate is concentrated and forms a highly effective fertiliser, but differs from a mixture of superphosphate and sulphate of ammonia, in that it contains no calcium, either as phosphate or as sulphate. Both calcium and sulphates are known to help plant growth, and it may be that their omission will prove to be a disadvantage to the farmer.

CONSUMPTION OF PHOSPHORIC ACID (P_2O_5) PER ACRE.

It is generally recognised now-a-days, in all up-to-date agricultural countries of the world, that it is essential to apply relatively heavy dressings of fertilisers containing phosphoric acid if the fertility of the land is to be maintained, and heavy crops to be secured, but this realisation is much greater in some countries than in others. The amounts of phosphoric acid (P_2O_5) used in some of the principal agricultural countries in 1928 are set out in the next table :—

TABLE XI.—*Phosphoric Acid (P_2O_5) Consumed per Acre of Cultivated Land in 1928.**

	Lbs. per Acre.
Holland	47·1
Belgium	30·9
Luxembourg	20·0
Denmark	18·1
Japan	16·9
Germany	14·9
Norway	13·3
Italy	10·4
France	10·4
Sweden	9·6
United Kingdom	6·4
United States of America	5·0
Canada	0·6

* Sir E. J. Russell in "Agricultural Research in 1929."

NOTE.—In Australia in 1928 there was probably an average of 15·5lbs of P_2O_5 per acre used on the total area cropped.

LIME AS A FERTILISER.

Although some plants require a lot of lime they are usually able to get it from the soil, because it is seldom absent to the extent of plants suffering for the want of it, and as a consequence it is rarely worth considering as a direct fertiliser. In some cases, where organic manures are the only ones available, light applications of lime increase the growth of plants as the result of being able to get their lime easily, but these cases are of rare occurrence. On the other hand, many soils require lime to correct poor mechanical condition, and because of this lime is a most important *soil amendment.* It also liberates other plant foods, and encourages the activities of soil bacteria, and as such is an *indirect fertiliser* of some consequence. The value of lime as an important aid to agriculture will be discussed in some detail later on under the heading of *Soil Amendments and Indirect Fertilisers.*

MANGANESE.

In a few small districts of the State, notably near Mount Gambier, Penola, and Corny Point, it has been common experience to have great difficulty in producing profitable crops of the cereals. The seed germinates well and the plants start off with normal vigor, but after attaining a few inches in height show characteristic signs of unhealthiness, and rapidly die. Messrs. G. Samuel and C. S. Piper, working in association at the Waite Research Institute have proved the trouble to be due to a deficiency of soluble manganese. Although the amount required by plants is very minute, and there is ample in the soil, for some unexplained reason it remains unavailable to the cereals, although some other cultivated plants appear to be able to get sufficient manganese from these patches. Experiments conducted in the past three seasons show that the addition of a small quantity of manganese sulphate at seeding time corrects the trouble and enables full crops to be grown. At present it looks as though 14lbs. to 28lbs. of manganese sulphate per acre applied in admixture with superphosphate is sufficient to lead to normal growth.

This trouble is of such rare occurrence that it need not be anticipated, and the addition of manganese as a manure will be necessary only on very few occasions.

COMPOUND FERTILISERS.

There are several compound fertilisers on the market which provide more than one of the essential plant foods, but most of these are proprietary mixtures, and are being added to or replaced as occasion demands. The compound fertilisers of importance are the organic manures, the principal one of which is farmyard manure.

FARMYARD MANURE.

Farmyard manure consists of the solid and liquid excrements of domesticated animals, together with the litter provided for bedding. It is the oldest, and is still the most popular of all manures. That is should prove a valuable manure is scarcely to be wondered at, for it was originally formed from plant growth, and it therefore contains all the elements present in the crops it is to help. Although farmyard manure consists of the principal parts of plants, and contains the bulk of the substances originally in the plants, it does not contain nearly as much of any of the main plant foods as are required, nor are they in the correct proportion for plants, nor do they all become available with equal rapidity. The nitrogen and phosphoric acid present are but slowly available, and even when liberal applications are given, it is found necessary for most crops to reinforce the farmyard manure with nitrogenous and phosphatic fertilisers. Although its direct benefit as a carrier of plant food is not so very wonderful, its indirect value makes it the most important of the manures. It is a common practice to use farmyard manure as a mulch, but unless the manure is well rotted before being used for such a purpose, the loss of the most expensive fertilising material—the nitrogen— is fairly considerable. Farmyard manure should be put *in* the soil and not be left on the surface. Any bulky organic matter, such as straw, weeds, &c., will make just as good a mulch as will the manure.

Farmyard manure in all of its various forms, has a very marked beneficial effect as a soil amendment, an encourager of soil bacteria, and as an indirect fertiliser, as well as being a direct fertiliser.

COMPOSITION OF FARMYARD MANURE.

The composition of farmyard manure is very variable, and probably no two samples would yield exactly similar results. The variations found in samples of the manure from the one kind of animal will be largely due to the proportions of solid excreta, urine, and bedding present, but type of foodstuff and whether the animals are being fattened, maintained, used for work or producing milk will also play an important part in deciding what the manurial value of the excrements will be. When ordinary mixed farmyard manure is being considered, the complication of the different types of animals, as well as the abovementioned factors, also leads to variation in composition.

There is a very great difference in the manurial value of the solid and liquid excreta. Animals that are not increasing in weight, but are only being maintained in store condition, excrete the whole of the nitrogen, phosphoric acid, and potash they receive, in a liquid or solid form, the digestible organic matter being mostly got rid of as gases. The fate of the manurial constituents varies according as they are present in the food as digestible or indigestible compounds. Whatever is digestible is excreted in the urine, and whatever resists digestion passes out, but slightly changed, in the solid excreta.

When the animal consuming the food is growing, or fattening, or yielding milk, a certain proportion of the manurial constituents in the food is retained. Cows in milk and young growing animals take the most from their foods, and the manurial value of their droppings is much lower than for animals only being maintained.

Because of these variations it is impossible to state the composition of the excreta of the various farm animals, except approximately. The next table gives the composition of the principal kinds of manures classed as farmyard manure.

TABLE XII.—*Analyses of Various Farmyard Manures.**

Manure.	Water.	Nitrogen.	Phosphoric Acid (P_2O_5).	Potash.	Lime.
	%	%	%	%	%
Mixed Farmyard Manure (fresh) .	75·0	0·39	0·18	0·45	0·49
Mixed Farmyard Manure (rotted).	75·0	0·50	0·26	0·63	0·70
Fresh Manure with straw—					
Horse	71·3	0·58	0·28	0·53	0·21
Cow	77·5	0·34	0·16	0·40	0·31
Sheep	64·6	0·83	0·23	0·67	0·33
Pig	72·4	0·45	0·19	0·60	0·08
Poultry Manure (fresh)—					
Fowls	56·0	1·63	1·54	0·85	2·40
Ducks	56·6	1·00	1·40	0·62	1·70
Geese	77·1	0·55	0·54	0·95	0·84
Pigeons	51·9	1·75	1·78	1·00	1·60
Urine—					
Horse	89·0	1·20	1·20	0·60	0·04
Cow	92·0	0·80	0·70	0·60	0·07
Sheep	86·5	1·40	0·50	0·60	0·30
Pig	97·5	0·30	1·25	0·06	0·02

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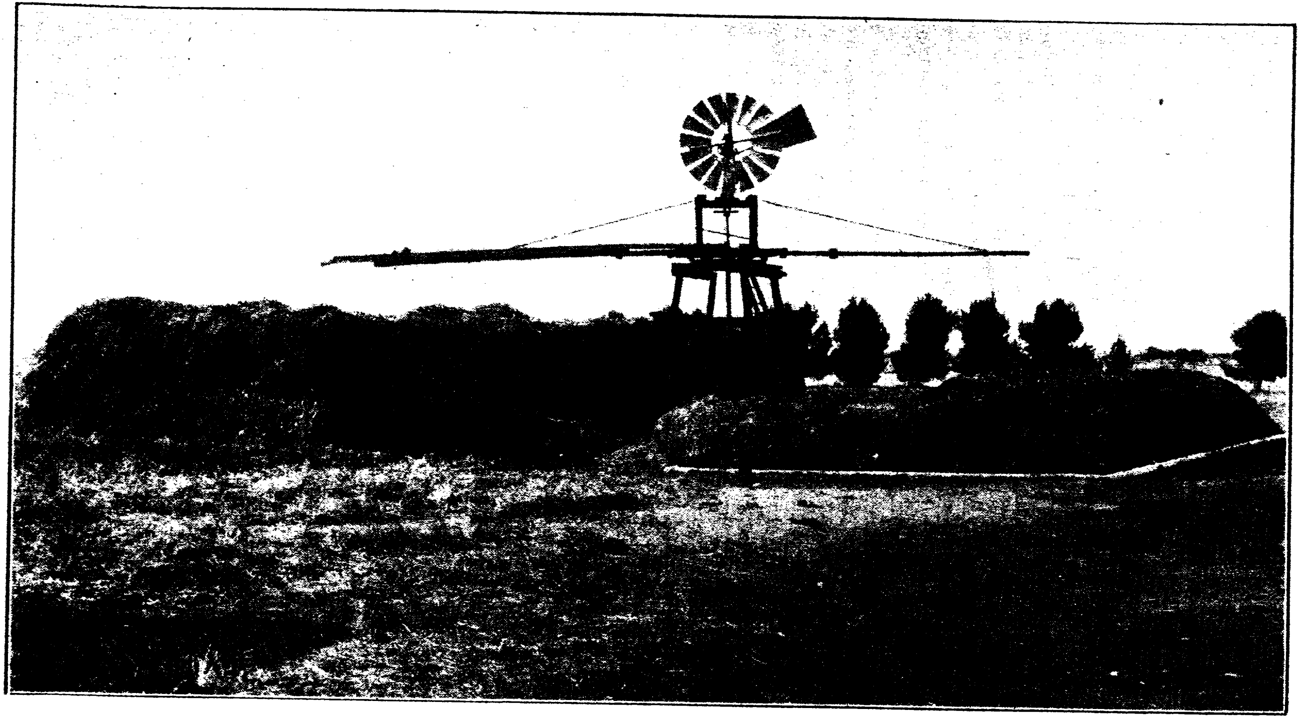
* "The Agricultural Notebook," by Primrose McConnell.



PRESERVATION OF FARMYARD MANURE.

Unless farmyard manure is carted straight from stables and stalls to the fields and immediately ploughed in, it should be carefully stored in stack or pit, and so treated that it rots down into a more or less cheesy mass. The illustration shows the method adopted at Roseworthy Agricultural College to attain this end. Two brick floors sloping towards a central pit are provided with low kerbing to prevent loss of liquid. The stack of manure is completed on one floor before the other is commenced. The liquid collected in the pit, from the washing of stables and draining from the manure, is lifted by a pump driven by windmill, and is distributed over the manure heaps from a pipe on a revolving platform.

In countries where farmyard manure is highly prized, and this applies to all the older agricultural countries in the world, a considerable quantity of litter is used when bedding down the animals. This litter is used to absorb the urine and other liquid portions of the excreta, and to supply organic matter to increase the bulk of the manure. Most of the materials used as litter contain appreciable amounts of plant food, and when they decompose along with the animal residues are converted into useful manures.

ROTTING THE MANURE.

Farmyard manure is much improved from a handling point of view, as well as from its fertilising qualities, when it is thoroughly decomposed into a damp, brownish-black mass of a more or less cheesy texture. This change in texture and composition is brought about by bacterial action in the manure heap or manure pit. The cleanings of stables and livestock stalls, including the fouled litter, are regularly placed in a pit or on a stack, and so cared for that regular decomposition takes place with the least possible loss of fertilising substances. The proper rotting of the manure is brought about by keeping the mass well compacted together and moist without being excessively wet. While the decomposition is taking place in a manure heap a good deal of liquid of a black color drains from it, and this should be carefully collected in a pit of some kind located near to the stack, and be sprinkled over the stack to maintain the necessary degree of moistness.

KINDS OF FARMYARD MANURE.

The ordinary farmyard manure to be found on farms where full care is taken of it, consists of a mixture of the excreta of several different kinds of livestock as well as much litter, and for general intensive farming is usually of really good quality. At times, however, the farmyard manure available consists of the droppings of only one kind of farm animal, and as each form of manure is of a different nature some knowledge of what is to be expected of them is desirable.

Horse Manure.

The composition of horse manure is probably more uniform than that produced by any other form of farm livestock. This manure is fairly rich in nitrogen, but there is considerable risk of this fertilising element being lost because the manure is relatively dry and of loose, open texture, and so is liable to develop rapid fermentation. Unless the fermentation of horse manure is delayed by keeping it moist and tightly packed together it rapidly loses fertilising value. Because of its rapid decomposition it is more suited for use in cold, wet soils than are most other forms of farmyard manure. In its rapid decomposition much heat is given off, and so it is a good kind of organic manure to use in hot beds, and to force the growth of plants.

The average amount of manure produced by a horse daily is about 33lbs. of solid and about 12lbs. of liquid excrement, or about 12,000lbs. and about 4,400lbs. annually. If an allowance is made of 5lbs. of straw per day, a horse that is housed every night makes about 8 tons of farmyard manure a year.

Cattle Manure.

The manure made from the droppings of cattle is not nearly so constant in composition as is horse manure. This manure contains a large percentage of water, and being of a dense nature it decomposes slowly without the development of noticeable heat. Once it becomes dry it takes a long time to split up in the soil. Because of its slow decomposition it is suitable for use in sandy soils, and can be depended upon to have a lasting effect.

Cattle void about 56lbs. of solid excreta and about 21lbs. of liquid daily, which is equal to about 20,000lbs. and 7,700lbs. annually. With a relatively small allowance of 4lbs. of straw per day, the amount of manure produced per head of cattle bedded down is about 13 tons per annum.

Sheep Manure.

The dung and urine of sheep, weight for weight, form the most valuable manure of any of the ordinary farm animals. From its richness in nitrogen, and from its dry condition, sheep dung is peculiarly liable to ferment. While richer in fertilising substances than horse manure it is not so rapid in its fermentation, due to the harder and more compact physical character of the solid excreta. It fills the same bill as horse manure, and is exceptionally well suited for the forcing of plants.

A sheep will produce about 2lbs. of solid excreta a day and about 1lb. of liquid, which is equal to about 730lbs. solids and 365lbs. liquid per year.

Pig Manure.

The food of the pig is so variable in its character that the composition of pig manure is also variable, depending upon the kind of foodstuffs consumed. When highly nitrogenous foods are employed the manure is rich, but when foods containing small amounts of fertilising constituents are used the manure is not so valuable. Pig manure is very similar to cattle manure in being wet, of slow decomposition, and in being suitable for light, sandy soils. It is usually a little richer than cow manure, and so of more value for crops.

A pig voids about 5lbs. of solids and 3½lbs. of liquids a day, equal to about 1,800lbs. and 1,200lbs. respectively per annum.

Bird Manure.

The droppings of the domesticated birds, particularly those of pigeons and fowls, are really well supplied with fertilising elements, and are suitable for application to all plants needing forcing. The nitrogen is contained in a quickly available form and unless carefully preserved, fermentation sets in and drives off considerable of this valuable constituent as ammonia. Lime should not be used where this manure is kept, as it hastens the liberation of the ammonia.

THE USE OF FARMYARD MANURE.

The value of farmyard manure for ordinary field crops depends almost wholly on the climatic conditions, and particularly on rainfall. It has very striking effects on most soils in the moister portions of the world, but in semi-arid climates like ours it has but low agricultural value except for market gardens and fruit orchards. In moist regions it decomposes slowly, and forms humus, which is of the highest value in most soils of moist districts. In dry regions it is of little use, because it tends to leave the soils loose and open for so long, and the nitrogen it contains is not required in these conditions where so much of this element is collected by the soil bacteria.

Where farmyard manure has proved to be valuable for field crops it is found to lead to more regular crops than any other type of fertiliser. Much work has been done in experimenting with farmyard manure at Rothamsted Experiment Station, and in one field, the famous Broadbalk field, wheat has been grown for 90 years continuously, and the treatment has not been varied for 80 years. The yields on the different plots vary greatly from year to year, but the variation is less on the plot receiving farmyard manure than on any of the others. The yield may not rise as high in good years as it does on some of the plots manured with artificials, but it never falls so low in a bad season. This steadying effect of farmyard manure on crop yields is one of its most valuable properties. The results secured at Rothamsted show :—

1. That farmyard manure maintains the fertility of the soil better than any ordinary combinations of artificials.
2. It leads to less variation in yield from year to year than artificials.
3. It causes less disturbance in quality as the yields increase than would be brought about by defective combinations of artificials.

EFFECT OF FARMYARD MANURE IN LOCAL CONDITIONS.

From the results secured from the use of farmyard manure in other hot, dry climates, success with this manure would not be expected in South Australia, except in special circumstances, and this proves to be the case. Almost without exception applications of farmyard manure prove uneconomic in all districts with less than 22in. of average annual rainfall. At Roseworthy College the question has been tested since 1904, and the tests show conclusively that dressings of farmyard manure are far from profitable.

TABLE XIII.—*Farmyard Manure for Wheat at Roseworthy.—Means for* 16 *Seasons to* 1928.

Manuring per Acre.	Yield per Acre. Grain.		Yield per Acre. Total Produce.		
	Bush.	lbs.	Tons	cwts.	lbs.
No Manure	11	25	1	7	67
14 tons Farmyard Manure	12	43	1	8	79
2cwts. Superphosphate (36 per cent.)	17	10	1	9	82
14 tons Farmyard Manure 2cwts. Superphosphate (36 per cent.)	18	28	1	16	2
14 tons Farmyard Manure 2cwts. Superphosphate (36 per cent.) ½cwt. Sulphate of Potash	19	51	1	17	28

DRESSINGS OF FARMYARD MANURE.

Where farmyard manure is effective the amount to be applied varies between very wide limits, and is controlled very largely by the type of soil and the crop to be manured. If this substance was being used as a direct fertiliser only, it would be easy to arrive at the quantity necessary, by having the manure analysed to show the plant food it contains, but as most of its value is as a soil amendment and an indirect fertiliser, experience must be followed when deciding on dressings.

The amounts of the principal fertilising substances present in mixed farmyard manure of average quality are somewhat as follows:—

TABLE XIV.—*Fertilising Materials in Rotted Farmyard Manure.—Pounds per Acre.*

Dressing per Acre.	Nitrogen. In Dressing.	Nitrogen. Equivalent to Sulphate of Ammonia.	Phosphoric Acid. In Dressing.	Phosphoric Acid. Equivalent to 45 per cent. Super.	Potash. In Dressing.	Potash. Equivalent to Muriate of Potash.	Lime.
Tons.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
10	112	560	58	281	141	282	157
15	168	840	87	421	211	423	235
20	224	1,120	116	562	282	564	314
25	280	1,400	145	702	352	705	392
30	336	1,680	174	843	423	846	471

In countries where farmyard manure is used regularly for field crops the dressings are always given to a crop which makes luxuriant growth. For instance, in a rotation such as the Norfolk Four-course Rotation of Wheat, Turnips, Barley, Clover, the farmyard manure is put into the land in the season that the turnips are grown and a dressing of this manure is given every time the land carries turnips.

When applications are to be given every fourth year from 10 tons to 15 tons per acre are given ; but when the rotation only admits of a dressing every six or eight years the quantity is increased, and may reach as much as 30 tons per acre.

ARTIFICIAL FARMYARD MANURE.

Straw is used as litter for stalled animals, and, being mingled with the excreta, is decomposed by micro-organisms to form the black, sticky substance known as humus. It has been realised recently that the straw need not be put under the animals for the purpose of effecting its decomposition, for it is found that the organisms work equally well if it is wetted with a solution of a nitrogen compound, such as an ammonium salt or cyanamide, and sufficient phosphate is added. The organisms rot down the material and give a black humus manure. The addition of nitrogenous salts and phosphates are not essential, for somewhat similar results can be secured by damping down the coarse organic matter with the liquid manure that drains from a manure heap.

If liquid manure is not used, about ¾cwt. of sulphate of ammonia, 1cwt. finely ground calcium carbonate, and a little finely ground raw rock phosphate should be added to each ton of straw or other coarse organic matter, and the heap should then be kept damp and well aerated. Cyanamide and a little phosphate can be used with good results.

This mode of making farmyard manure is proving very useful where insufficient livestock is kept to make enough manure, as in market gardens, orchards, vineyards, and for some special types of farming, and all sorts of waste organic materials are being decomposed in this way.

GUANO.

Guano is a manure consisting almost wholly of the excreta of sea birds, and at one time was a most important fertiliser, containing a fairly high percentage of both nitrogen and phosphoric acid, but it became so popular that the principal deposits of the world were soon used up, and at the present time it is exceedingly difficult to purchase natural guano which has not had most of the nitrogen leached out of it. The most important deposits of guano yet known in the world were found on small islands off the coast of Peru, where rain rarely falls. These islands and the uninhabited coast are used for breeding purposes by enormous flocks of pelicans, albatrosses, and other sea birds which only use land during the breeding season. Throughout the breeding season the birds literally cover the ground, and the young birds, after they are hatched, are fed on fish until they are able to fly. The excrement voided by these birds is rich in nitrogen and phosphoric acid, because the fish which is their food is rich in these substances. In addition to the excreta, feathers, the remains of young birds that die, fragments of fish, seaweed, and even sand swallowed by the birds, all go to make up guano. As the region where these deposits occur is practically rainless and has a hot, dry climate, the droppings of the sea birds rapidly dry, and so prevent any change, or loss, by fermentation.

There is some loss of nitrogen from guano due to the formation of ammonium carbonate which is volatile, and to leaching by the occasional rains that fall. There is a great difference in the composition of the various samples of guano secured ; guanos from the same island show marked variation, while the samples from different islands vary even more. The oldest deposits usually contain less nitrogen and more phosphoric acid than the more recent. In a damp climate, fermentation destroys all or most of the organic matter, driving off and leaching the nitrogen, and washing out some phosphoric acid.

Guanos range from rich nitrogenous deposits to phosphatic deposits which only contain traces of nitrogen and considerable amounts of phosphate of lime. Freshly-deposited guano is collected which contains about 16 per cent. nitrogen and about 9 per cent. phosphoric acid, whilst some of the phosphatic guanos may contain as much as 60 per cent. of calcium phosphate and only 2 per cent. to 3 per cent. of nitrogen. In Europe, importers of guano make up a mixture to a standard composition with about 7 per cent. nitrogen, which is sold as equalised Peruvian guano.

Peruvian guano as imported is a loose, dry powder, grey in the richer samples, and becoming browner as it grows more phosphatic. It is usually friable, and can be evenly distributed by the ordinary seed drill. It possesses a strong and characteristically ammoniacal odor.

It has been estimated that the birds depositing the guano on the Peruvian islands are so numerous that the production of fresh guano is 10,000 tons per annum. The Peruvian Government have arranged for a four-months close season during the breeding of the birds, in which time the deposits are not to be worked, and throughout the remainder of the year the removal of guano is controlled so that the previous year's deposits and some of the older deposits are removed annually.

A good guano is naturally a well-balanced manure, and as the compounds of nitrogen present are of several different forms, requiring different series of bacterial changes in the soil before they become available, it is a safe manure to use for all crops, and does not tend to over-stimulate plants in the same manner as do some more active nitrogenous fertilisers. When obtainable at a reasonable price, a good guano is a most suitable manure for orchards, gardens, and intense culture generally, particularly for use by individuals not thoroughly understanding manures and manuring.

GREEN MANURING.

Any growing plants ploughed in are generally referred to as "Green Manure," but the term is more often narrowed down to include crops which are grown for the express purpose of ploughing them into the soil. The practice is generally availed of where farmyard manure is scarce, and where it is essential to build up the organic-matter content of the land. A green manure helps the soil by increasing the amount of humus, by loosening heavy-textured soils, and increasing the retentiveness of sandy soils, by activating the useful soil bacteria, and by generally increasing the fertility of the land.

A great number of kinds of crops are used for green manure, but it is usual to give preference to a rapidly-growing crop which will decompose quickly after being ploughed under. Because leguminous crops, with the aid of bacteria, collect a lot of nitrogen from the air, and many of them make sappy growth which decomposes readily, they are generally considered to be better as green manuring crops than other kinds. This does not always prove to be so, and it is not uncommon to get better results after ploughing in a crop like mustard than after vetches or clover. When deciding on what crop is to be grown as a green manure, the main consideration will always be what crop can be grown well at the most convenient season of the year. If other things are equal, preference should always be given to a legume, but as any organic matter that will decompose readily in the soil leads to the collection of much nitrogen from the atmosphere by some of the soil bacteria which help to split it up, so any crop that will grow luxuriantly and decompose readily makes good green manure.

In this State the only districts utilising green manuring to any extent are the Irrigated Fruit Districts of the Upper Murray, and in these it is rapidly becoming normal practice to green manure a portion of the orchards and vineyards every year. Of crops suitable for the purpose in South Australia, Tick Beans, Peas, King Island Melilot, Mustard, Rye, Barley, Wheat, and Oats can be grown in the autumn and winter, whilst Rape and Mustard can be grown in the spring.

Green-manure crops should be ploughed into the land whilst still soft and sappy, and in most cases this means that they must be turned in not later than when in the flowering stage.

Although the principal additions to the soil by ploughing in green manure are organic matter and some nitrogen, the fertility of the surface soil is increased, and considerably so by deep-rooted crops. The crops collect plant food from the underlayers of the soil and it is transferred to the upper layers when the plants are ploughed in, and adds to the store of available plant food when the manure decomposes.

DRIED BLOOD.

Dried blood contains some phosphoric acid, the amount varying with the impurities, but it is usually so little that the manure can almost be taken as essentially a nitrogenous fertiliser. Originating as it does in slaughter-houses, and sometimes containing appreciable bone chips, it is far from uniform in composition, and so some care is necessary when purchasing it. It should contain from 9 per cent. to 14 per cent. of nitrogen and from 1 per cent. to 3 per cent. of phosphoric acid. Dried blood is a really valuable organic manure, undergoing decomposition rapidly in the soil, and liberating for the use of plants about 96 per cent. of its total nitrogen in the year of application. It is, however, of more value to manure manufacturers for using in their proprietary mixtures, for which purpose it is very suitable, being rich in organic nitrogen and possessed of good mechanical condition.

SOIL AMENDMENTS AND INDIRECT FERTILISERS.

Besides the materials already discussed, all of which are direct fertilisers, there are others which improve the soil texture, and liberate plant foods from unavailable forms, and as such are known as Soil Amendments and Indirect Fertilisers. The principal ones of these are Farmyard Manure, Lime, Gypsum, and Salt.

FARMYARD MANURE AS A SOIL AMENDMENT.

Besides being a valuable direct fertiliser farmyard manure is a very important substance, in common with most bulky vegetable matter, for the amelioration of unfavorable mechanical condition of soils, and in acting as an indirect fertiliser. Its physical effects upon the texture and water-holding powers of soils are extremely important, enabling them to resist droughts or dry spells much better than soils lacking in organic matter. Heavy-textured soils are loosened and rendered more friable and open by liberal applications of farmyard manure, and to bring this change about fresh manure is much better than rotted manure. On light soils, where friability and openness are too great, it gives cohesion and water-retaining powers, and for the purpose well-rotted manure is better than the fresh. Its decomposition in the soil increases the warmth of the soil, thus helping germination and growth generally, particularly in cold locations.

The farmyard manure when it rots down in the soil, goes to restore the stock of humus, which otherwise is always tending to oxidise and diminish, and the humus, considered merely from the physical side, contributes largely to the fertility of the soil. It improves the texture of the soil, and enables the preparation of a good seedbed. The importance of a good seedbed as an aid to the production of big crops can hardly be exaggerated, as it is the basis of all good farming. Of course the value of humus, and in this respect of farmyard manure, will vary with different soils, with different crops, and in different climates. Cereals, for example, are comparatively unaffected by its absence, and in semi-arid climates few crops are benefited by its presence in quantity.

In the splitting up of the farmyard manure in the soil the bacteria also act on the mineral soil particles, and in doing so liberate mineral plant foods from their close combinations. The large quantity of carbonic acid gas and other organic acids liberated during the decomposition of the manure, very considerably increase the solvent power of the soil moisture, and so more mineral plant foods are brought within the reach of plants.

The addition of farmyard manure increases the activity of the useful soil bacteria, and besides providing work for some of them in splitting up the organic matter, during which process much nitrogen is collected from the atmosphere, it appears to tone up other kinds as well.

Applications of farmyard manure to patches of soil which have been sterilised by the concentration of an excess of sodium chloride at the surface, will often correct the trouble, by tending to keep the salt below the surface, so enabling plants to get a start.

LIME.

Lime is not only an essential plant food, but has a very marked effect on the mechanical condition of the soil, and on the liberation of other plant foods from their unavailable combinations. When present in soils in large quantities, lower percentages of potash, phosphoric acid, and nitrogen are adequate for maximum growth, so that an application of lime, even when a soil is not very deficient in this substance, to some extent does away with the need of applications of other fertilisers. This stimulating action of lime adds nothing to the fertility of the soil, but hastens its depletion by enabling the soil to give up the fertility it already contains, and gives meaning to the old couplet—

> "Lime and lime without manure,
> Will make both farm and farmer poor."

As a consequence of this powerful stimulation by lime, it should only be applied to soils in conjunction with manures.

The mechanical effect of lime on the soil is to loosen heavy-textured clayey soils, and to make loose sandy soils somewhat firmer. On heavy, clayey soils lime leads to the flocculation of the fine soil particles, and creates an artificial coarseness of texture. This makes the soils lighter to work and more porous, and does away with the tendency to become slippery or boggy when wet. Such soils, after treatment with lime, do not tend to crack so badly when they dry out. It is difficult to exaggerate the improvement that applications of lime bring about with soils which are very slippery when really wet, sticky as they begin to dry out, and contract so much that large cracks form when they are dry. And also of importance is the fact that the beneficial effect lasts for many years after the dressing of lime is given. On the lighter soils—sands and gravels—lime exerts a good effect by forming a weak cementing agent, and so increasing the cohesion of the particles. If lime is to be applied to light sandy soils it should be in the form of a calcium carbonate and not as quicklime.

Lime neutralises the acids formed in the soil, and this is one of its most important functions. The great bulk of the cultivated plants of the world have been domesticated in soils comparatively well supplied with lime, and will not give full returns in soils containing an excess of acid. There are some of the important cultivated crops which do well in sour soils, and a few for which success is almost dependent upon the presence of excess of acid, but this is not so for the great majority of our crops. The acids formed by the decomposition of organic matter, and the interaction between various soil constituents, accumulate in the soil to a dangerous extent if there is not something present with which they can combine. Lime is the most important of materials which can be used economically for the purpose of neutralising acidity when soils do not contain sufficient of substances to fulfil their requirements in this direction, and applications of it have a most beneficial effect on the general fertility of soils by reducing the acidity.

One of the most important happenings in the soil affecting its fertility is the conversion of the various compounds of nitrogen which find their way into the soil into nitrates, which as far as we know is the only form in which plants can make use of this essential and difficult-to-come-by plant food. This change of form is known as *nitrification*, and is brought about by the activities of at least three different kinds of bacteria. If the nitrogen is not in combination as ammonium salt, it is first converted into ammonia, the ammonia is changed to nitrous acid by another form of bacteria, and finally the nitrous acid is acted upon by a still different bacteria to be altered to nitric acid. These changes cannot be brought about by bacteria acting on the ammonia and nitric acid as such, but they must be combined up as *ammonium salts* and *nitrites* for the bacteria to be able to affect them. The presence of adequate supplies of lime in the soil ensure that the activities of the nitrifying bacteria are not hampered in any way, as there is never an excess of nitrous or nitric acid to hinder them in their work. In the absence of sufficient bases in the soil to combine with the acids, the reverse action to *nitrification* takes place, in which the available nitrogen in the form of nitrates is changed to a nitrite form, or even into ammonia, in both cases losing its availability. This action is known as *denitrification*, and is a retrograde step which lowers the fertility of the land, and there is no way in which it can be corrected with more certainty, and more economically, than by giving dressings of lime.

The by-products of much of the bacterial action in the soil are acids, and the accumulation of these retards the activity of the bacteria producing them. The presence of lime, so that it can combine with these acids as formed, encourages the activities of the bacteria, most of which help the crop-grower by liberating mineral plant food from its hard-held combinations. Nearly all of the legumes require the presence of plenty of lime to enable them to make full growth, and where this can happen the bacteria living on their roots are more active, and so more nitrogen is collected from the atmosphere. Applications of lime usually encourage the growth of the leguminous crops in all soils lacking in this material, and at the same time increase the activities of the root bacteria.

Lime is not only a plant food itself, but it possesses the power of liberating other plant foods in the soil. When in solution in the soil moisture, lime attacks some of the soil combinations containing potash, and changes places with the potash which then dissolves in the soil moisture and is available to plants. In soils rich in ironstone, phosphoric acid is very liable to combine with iron and alumina to form insoluble salts, and in these soils applications of lime are of great value, because they lead to the formation of some calcium phosphate and so increase the amount of available phosphoric acid.

The presence of adequate supplies of lime ensures that the bacteria which lead to the splitting up of organic matter are much more active, and this material is then rapidly converted into humus. Not only is the humus produced more quickly, but it has a greater power of retaining the nitrogen of the original organic matter than if there is a shortage of lime.

It is often claimed that lime tends to counteract the injurious effects of some plant diseases, but its action in this direction appears to be that it encourages such healthy, vigorous growth in most cultivated plants that they grow away from the attacks of these diseases.

FORMS OF LIME.

When agriculturists use the term lime, it is made to apply to Calcium oxide (CaO), to Calcium hydrate ($Ca(OH)_2$), or to Calcium carbonate ($CaCO_3$). Strictly speaking the term should only be used to designate Calcium oxide, but it is of little importance applying it to include other substances containing calcium provided it is recognised that there are different salts of calcium having similar effects when put into the soil. What is of importance to know is that different quantities of the various salts of calcium are necessary to produce equal results.

Calcium carbonate, in the form of limestone, chalk, and shells, is very common in the world, and in all of its forms is found in very extensive deposits. When calcium carbonate is burnt, the carbonic acid gas is driven off and lime or calcium oxide remains. This lime is known as Quicklime, Caustic lime, and Burned lime. Quicklime readily absorbs water, and if water be added to it, or if it be exposed to damp atmosphere, it combines with some of the moisture and becomes Calcium hydrate, or as it is more frequently known, Slaked lime. Quicklime is in the form of hard, stony lumps, but on slaking it falls to a powder almost as fine as flour. On further exposure to the air Slaked lime takes up carbonic acid gas, which replaces the water and converts it into calcium carbonate again, so completing the full cycle.

One hundred pounds of calcium carbonate make from 50lbs. to 56lbs. of quicklime, and when this is slaked it produces about 75lbs. to 85lbs. of calcium hydrate. When applying any form of lime it should be remembered that if 1,000lbs. of quicklime will do what is desired, it will take about 1,600lbs. of slaked lime, or about 2,000lbs. of finely-ground calcium carbonate to do the same work.

Although all the forms of calcium carbonate are chemically the same, their behaviour when added to the soil is not similar for all of them. Limestone and chalk when finely ground are very active soil amendments, correcting excessive acidity, overcoming stickiness, encouraging soil bacteria and liberating mineral plant food, whereas the other common form of calcium carbonate, shells, is very inactive as a soil improver, even if they be finely ground. Shells consist of a flaky and glazed form of calcium carbonate which is very resistant to the weak acids present in the soil, and although it has some ameliorating influence on soils, very heavy dressings are necessary, and even then it must be finely ground. Under South Australian conditions dressings of crushed or ground shells do not prove economic propositions for any of the ordinary soils used for agriculture.

APPLICATIONS OF LIME.

Before artificial fertilisers were known, and liming was more general than at present, dressings of 5 tons to 8 tons per acre were usual, and it was expected that they would not need replacing for several years, but it is now known that these very heavy dressings act injuriously by causing too rapid oxidation in the soil at first, and better results follow applications of from ½ to 1 ton per acre given more frequently. Applications of 10cwts. of lime per acre may need replacing every three to five years, depending on how acid the soil is, but less frequently if the lime were used to correct poor mechanical condition of the soil. If ground limestone is to be used, about double as much must be used per acre, whilst for slaked lime the dressing would be about half way between the other two.

As lime tends to sink into the soil rather quickly, it should always be applied on the top of cultivated soil and be mixed with the surface layers with harrows or rakes, and should on no account be ploughed or dug in, as it is then placed too far below the surface.

Quicklime is sometimes ground before being distributed over the land, but it is more usual to slake the lime and immediately spread it. The lime can be slaked in a shed by exposing it to the air, or by damping it with water, and as soon as it has broken down to a fine powder it is broadcasted from a machine made specially for the purpose, and known as a lime spreader. Sometimes the quicklime is slaked in the field by regularly spacing small heaps of it, covering them with soil, and leaving for a week or so, when it will break down into a fine powder. The heaps are exposed, and the slaked lime is distributed by throwing it with shovels to spread it as evenly as possible. When the job is to be done quickly the small heaps of lime in the field are slaked with water from a water cart, and provided no excess of water is added, the spreading can be done a very short while after adding the water.

LIME IN SOUTH AUSTRALIA.

Practically all of the country in South Australia receiving less than 25in. of average annual rainfall is well supplied with lime for plant food, and to keep the soil sweet and of fair mechanical condition, with the exception of the red gum country of the South-east, and small patches of soil scattered over the wheat-growing districts. In the sour soils of the South-East, and the Adelaide Hills, dressings of one ton lime per acre, to be replaced every 10 years or so, give marked results on pasture land and for annual crops, whilst for intense culture, and particularly for market gardening, more frequent applications are beneficial. For the heavy-textured "red" soils, and boggy patches found in some of the wheat fields of the Lower North, dressings of 10cwts. to 20cwts. lime per acre correct the trouble, and probably will not need replacing more frequently than every 20 years or so.

GYPSUM.

Gypsum, or sulphate of lime, is an important indirect fertiliser and soil amendment. It benefits some plants to a remarkable degree, especially the legumes and other plants that are dependent upon a plentiful supply of potash. Although the beneficial results have been known for a long time, no reasonable explanation of the action of the gypsum has been forthcoming, except that potash is liberated in the soil. The analyses of leguminous plants grown with and without applications of gypsum, generally show but little difference in the amounts of calcium, phosphorus, and sulphur present, but a very great increase in the potash content of the plants grown on the treated land. Besides liberating potash, gypsum aids in the decomposition of organic matter, and absorbs and retains volatile ammonium compounds. When used as an indirect fertiliser, gypsum should be applied in small doses often, rather than in large doses occasionally.

As a soil amendment, gypsum is extremely useful in correcting excessive stickiness in clay soils. It is a really good flocculating agent, and the benefits following dressings of it are of a very lasting nature.

In some soils an interaction takes place between the clay they contain and sodium salts. This occurs at times when irrigation is practised on soils containing a good deal of salt, or at other times when the irrigation water being used contains an appreciable amount of sodium salts in solution. The calcium complex of the clay of normally fertile soils, in which ordinary agricultural crops grow well, is acted upon by sodium chloride or sodium sulphate, to convert the calcium clay into a sodium clay. The calcium chloride or sulphate which is formed is then washed out, and the soil becomes sticky and impermeable, and injurious salts accumulate; and then these two factors—salt and impermeability— greatly injure, and may kill, the crop. Further, the sodium clay gives rise to sodium carbonate (black alkali), which is itself harmful to plants and brings into solution the harmful alumina. Additions of gypsum to the soil causes the sodium clay to change once more to calcium clay, so restoring the soil to its normal condition. The interchange is impeded if large amounts of sodium salts are present, so it is necessary to wash them out before adding gypsum.

Where gypsum is to be used as an *indirect fertiliser* or to "tone-up" the soil, applications of 2cwts. to 4cwts. per acre each time the land is cropped are sufficient Where it is to be used to overcome excessive stickiness of soils it should be applied at the rate of about 10cwts. per acre, and it will be found that the benefits will last for many years, and in all probability a second application will not be required for 15 years or more. To prevent the heavy-textured irrigated soils of the Upper River Murray from developing bad mechanical condition, dressings of 8 tons to 10 tons per acre are given.

SALT.

In some parts of the world the use of salt, either alone or in admixture with fertilisers is a common practice, and is usually applied to those plants which were supposed to have originated near the sea shore. Salt liberates potash, and providing the rainfall is heavy enough, or irrigation is practised, applications of it benefit all plants needing much potash. It should never be used unless the water supply is good, because a concentration of this substance at the surface ruins the mechanical condition of the soil, and prevents the germination of seeds.

The great majority of South Australian soils contain so much salt normally that it would be positively dangerous to add more to them, and as all of our soils give up their potash very readily, additions of common salt could not be expected to give beneficial results.

"COMPLETE" MANURES.

A "complete" manure is generally recognised as one containing all three fertilising materials—nitrogen, phosphoric acid, and potash—in proportions to suit the crop to which it is to be supplied. As all classes of plants require different proportions of the various plant foods, it would be necessary to have a different mixture for each kind of crop, if best results are to be got by using "complete" manures, but as this would not be a practicable proceeding, the mixtures put on the market are made somewhere near to what are the average requirements of certain types of plants, and then for special cases additions are made of the extra plant foods required. The composition of various brands of complete manures vary considerably, as can be seen in the following table, which shows some of the "complete" manures on the Adelaide market at the present time :—

Table XV.—"*Complete*" *Manures Sold in Adelaide.*

Manure.	Nitrogen.	Potash.		Phosphate.		Total.
			Water-soluble.	Citrate-soluble.	Acid-soluble.	
	%	%	%	%	%	%
A.	8·0	5·0	22·0	1·0	1·0	24
B.	5·0	4·5	18·0	6·0	4·0	28
C.	1·5	4·5	20·0	8·0	4·0	32
D.	1·5	7·5	28·0	1·0	2·0	31
E.	1·5	7·5	15·5	3·1	29·5	48
F.	1·0	2·0	41·0	1·0	2·0	44
G.	1·5	2·5	20·0	4·0	18·0	42
H.	1·75	2·5	17·0	12·0	6·0	35
I.	2·0	2·0	20·0	8·0	4·0	32
J.	1·0	2·0	42·0	—	—	42

In South Australia "complete" manures are only used in market gardens, suburban gardens, and by fruit growers, and on present appearances never will be economically useful for field crops.

QUANTITIES OF FERTILISERS TO APPLY.

It is quite impossible to state definitely what quantity of any given fertiliser should be applied to a particular crop, because the amount required will depend very largely on the fertility of the soil, on the climatic conditions of the district, on the system of cropping being practised, and on the price of produce. Most of the cultivated crops are grown on soils of many different types, which on analyses and cropping results show various degrees of fertility, and so it would be unreasonable to use the same amount of manure for all kinds of soils. The climatic conditions affect the cropping capabilities of soils, and so it would not be economically correct to give equal dressings of fertiliser in a low rainfall district as in a good district, just because the soils were of the same type. The system of cropping being followed plays a great part in deciding what quantity of manure should be applied to the various crops, because in a properly arranged rotation of crops, which includes a number of different kinds of plants, it is often good practice to manure one crop heavily for the benefit of the succeeding crop. When prices of produce are high there is an incentive to give liberal applications of manures to crops, to aim at producing maximum yields, but when low prices are the rule the most economic dressing of fertiliser is often much lower that that capable of encouraging the highest returns.

FERTILISERS FOR INTENSE CULTURE.

For manuring where intense culture is being practised, such as in market gardens, where the whole land is covered with plants, some of which make very strong growth, and where the land carries a heavy growth of plants during most of the the year, it is necessary to add a lot of fertilising material. If the fertility of such land is to be kept up so that heavy crops can be carried for a long period of time, at least as much plant food must be put back into the soil as is taken out by the plants. To be able to do this without wasting materials it is necessary to know what plants remove from the soil, of those substances of which the soil is likely to become deficient. Some plants take much more of the essential plant foods than do others, but on the average it can be taken that an ordinary assortment of garden plants will remove about 50lbs. nitrogen, about 20lbs. phosphoric acid, and about 50lbs. potash per acre from the soil during the season. The aim should be to at least replace the equivalent of these amounts of fertilising materials each time the land is planted, in the case of annuals, and not less than once a year with perennials, and if this is done sufficient plant food will be maintained in the soil to produce good growth for a long period of time. These plant foods can be put into the soil by applications of well known manures, and perhaps the most satisfactory in normal conditions would be :—250lbs. sulphate of ammonia (20 per cent.) to replace the nitrogen, 97lbs. superphosphate (45 per cent.) to supply the phosphoric acid, and 96lbs. muriate of potash (52 per cent.) to make good the potash. In practice it is found that some of the phosphoric acid supplied in superphosphate becomes unavailable to plants, and so the dressing of this manure should be increased ; and on the other hand most soils are so well supplied with potash, and in sunny climates give it up so readily to plants, that full crops can be obtained for a very long period of time without making good all the potash taken up by plants. As a general rule it can be taken that where intense culture is being practised to the extent that is usual in market gardens, flower gardens, and home gardens, the equivalent of 200lbs. sulphate of ammonia, 168lbs. superphosphate (45 per cent.), and 80lbs. muriate of potash should be applied at every planting season if the mineral plant food content of the soil is to be maintained.

To be able to put all three fertilising materials on the land at the one time would naturally simplify the operation, and it could be done quite easily, but it must always be remembered that most nitrogenous fertilisers are very liable to be washed out of the soil, and so best results are usually obtained by supplying the phosphoric acid, the potash, and some of the nitrogen in a mixture, and then make up the required amount of nitrogen in two or three extra applications during the growth of the plants. For most plants a mixture consisting of two parts superphosphate (45 per cent.), one part sulphate ammonia, and one part muriate of potash applied at the rate of 300lbs. per acre every planting, will give good results on all soils well supplied with lime and organic matter, provided that sulphate of ammonia is applied at the rate of ½cwt. per acre twice during the growth of the plants.

To ensure success where very heavy and varied cropping is practised, and to keep up the fertility of the soil to a high pitch, farmyard manure should be added at the rate of 10 tons per acre every second year, or 20 tons every fourth year, and about 5cwts. lime or finely-ground calcium carbonate per acre every second year should be distributed, as well as the manures already suggested.

In soils of heavy texture the amount of lime can be increased, and some of the phosphoric acid could be supplied in raw rock phosphate. Smaller dressings of lime can be used in light sandy soils, but the amount of potash should be increased, and in some cases the nitrogenous manures used should be greater, whilst bonedust can replace some superphosphate, if it is procurable at a reasonable price. In calcareous soils the quantity of lime can be considerably reduced or done away with altogether, and an increase in the amount of potash supplied is sometimes advantageous. In peaty soils the farmyard manure can be omitted, the dressing of lime and potash increased, and the nitrogen reduced.

MANURING OF CEREALS.

The cereals commonly grown in Australia—wheat, barley, and oats—do not remove such large quantities of mineral matters from the soil, as is the case with many other types of crops, and of the three important manurial substances, they utilise more nitrogen than potash or phosphoric acid. It is the usual experience, however, to find that although cereals require a relatively small amount of phosphoric acid, in the vast majority of the districts where these crops are grown, it has not yet been found necessary nor economical to fertilise the cereals with anything other than phosphatic manures.

NITROGEN FOR CEREALS.

It appears that nitrogenous manures have not proved profitable when applied to cereal crops because Australian soils are comparatively new, and the land is frequently bare fallowed. During the process of fallowing, large quantities of nitrogen are collected from the atmosphere by the soil bacteria, and because of the semi-arid climate experienced by this country, much nitrogen is also collected during the process of soil preparation and when the crop is growing, even though the land was not fallowed immediately prior to cropping. Applications of nitrogenous manures to cereals usually give some increase in the yield of grain, but it is generally so slight that it does not cover the cost of the extra fertiliser. The next table sets out what has been the effect of adding nitrogen to wheat crops in various parts of the State :—

TABLE XVI.—*Effect of Nitrogenous Manures on Wheat in South Australia.*

Location.	Yield of Wheat per Acre per Year.															
	Period.	No Manure.		1cwt. Super.		2cwts. Super.		Super. and ¼cwt. Nitrate of Soda.		Super. and ½cwt. Nitrate of Soda.		Super. and 1cwt. Nitrate of Soda.		Super. and ½cwt. Sulphate of Ammonia.	
	Years.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Roseworthy .	22	13	2	—		18	56	—		—		19	28	—	
Roseworthy .	16	11	34	—		17	10	17	10	18	35	—		16	40
Booborowie .	13	19	25	26	22	—		—		29	6	—		28	31
Booborowie .	13	19	25	—		28	6	—		29	6	—		28	46
Veitch	9	11	34	13	48	—		—		14	0	—		—	
Turretfield ..	5	13	0	15	11	—		—		16	23	—		17	19
Turretfield ..	5	13	0	—		16	3	—		17	5	—		17	14

The figures in the above table show that at Roseworthy Agricultural College—(*a*) the addition of ¼cwt. nitrate of soda per acre had no effect on the wheat yield, (*b*) ½cwt. increased the yield by 1bush. 25lbs., (*c*) 1cwt. only led to the addition of 32lbs. of wheat on the yield, whilst (*d*) sulphate of ammonia appears to have a depressing effect on the yield of wheat. At Booborowie Experimental Farm the addition of ½cwt. nitrate of soda to 1cwt. of superphosphate per acre increased the yield by 2bush. 44lbs., but when added to 2cwts. of superphosphate per acre the increase was reduced to exactly 1bush. per acre. At Veitch Experimental Farm hardly any increase followed the use of nitrogen, whilst at Turretfield Experimental Farm about 1bush. increase followed the use of nitrate of soda, whilst sulphate of ammonia had a more beneficial result.

Although an increased yield was produced at each of the experimental stations, in no case was it an economic one. It must be remembered, however, that in all cases cited the crops were grown on bare fallow, where nitrogenous fertilisers can hardly be expected to have much influence, and as we learn to do without so much bare fallow in the better cereal-growing districts of the State, the position in regard to dressings of nitrogen for cereals may be considerably modified.

It is sometimes claimed that, although nitrogen does not have much beneficial effect on grain crops grown on fallowed land, it is worth while for hay crops, because it tends to encourage growth rather than the production of grain. This is not found to be so at Roseworthy Agricultural College where records are kept of the total produce as cut with the binder, as well as the grain yields, and the slight increases of hay received are just about in the same proportions as the increased grain yields. For instance, for the 16-year period ending 1928, the yield of hay from plots receiving 2cwts. superphosphate per acre, has averaged 1 ton 16cwts. 29lbs. per acre, and the addition of ½cwt. nitrate of soda per acre increases it by 4cwts. 73lbs. per acre, but using ½cwt. sulphate of ammonia per acre only adds 59lbs. of hay.

The assertion is frequently made that because malting barley is not grown as a fallow crop but usually on land that has been left out as pasture, or on wheat stubbles, nitrogenous fertilisers should be used on the crop. This is yet to be proved, and in the present state of the fertility of most of our cereal-growing lands it is very doubtful if economic benefits will follow the use of nitrogen, except in a few localities. There seems to be no doubt that increased growth, and perhaps increased grain yields, would be secured in plenty of soils where barley is now grown, but at present, to get profits from crops of malting barley it is essential that good quality grain be produced, and in our climate the least bit of extra luxuriance of growth is very liable to lead to the pinching of the grain, and a much lowered market value. Further, malting barley is only of good quality when the nitrogen-content of the grain is relatively low, and the addition of nitrogen to soils in a climate such as ours, tends to raise the nitrogen-content of the grain to too high a point for first-class malt to be made from it.

When it is desired to produce heavy hay yields from wheat or oat crops grown on unfallowed soils, the addition of some nitrogen may prove a business proposition, particularly on sandy soils, but this has not yet proved to be general in South Australia.

If cereal crops go yellow in the winter because of excessive wetness, or because of low fertility and coldness of sandy soils, the addition of about ½cwt. to 1cwt. of sulphate ammonia or nitrate of soda put on as a top dressing in the early spring revives the crops much quicker than if left untreated, and in all probability leads to economic increases in yields.

Potash for Cereals.

Australian soils are notably rich in potash, or, if not so, readily give up to plants sufficient of this substance for their needs, and as a consequence dressings of potassic manures are usually quite unprofitable, and as a matter of fact, in some localities they have a depressing effect upon cereal crops. This rapid liberation of potash in Australian soils appears to have some connection with the amount of sunlight experienced here, because it is becoming generally recognised that potassium salts are more effective than other plant foods in enabling plants to utilise the diminished light under shaded conditions. Whatever the explanation may be, it is an established fact that very few crops benefit from additions of potassic fertilisers in this State, even in soils extremely poor in total potash, and it is one of the advantages of our climatic conditions that this should be so. The effect of potassic manures on South Australian wheat crops is set out in the next table.

TABLE XVII.—*Effect of Potassic Manures on Wheat in South Australia.*

Location.	Period.	Yield of Wheat per Acre per Year.					
		No Manure.	1cwt. Super.	2cwts. Super.	Super. and ½cwt. Sulphate of Potash.	Super. and ½cwt. Muriate of Potash.	½cwt. Sulphate of Potash Alone.
	Years.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
Roseworthy	17	11 27	—	16 35	17 26	16 51	14 53
Booborowie	13	19 25	26 22	—	—	27 22	—
Booborowie	13	19 25	—	28 6	—	27 56	—
Veitch ...	9	11 34	13 48	—	13 37	—	—
Turretfield.	5	13 0	15 11	—	17 0	—	—
Turretfield.	5	13 0	—	16 3	18 9	—	—
Smoky Bay	3	14 49	16 25		16 40	—	13 33
Smoky Bay	3	14 49	—	18 55	18 30	—	13 33

The figures presented in the table show quite definitely that potassic fertilisers are not required for wheat crops in this State. At Roseworthy Agricultural College potash alone does give an increased yield of wheat of 3bush. 26lbs. per acre over the unfertilised plot, and sulphate of potash gives a 1bush. increase when added to superphosphate, but the addition of muriate of potash does not help the crop. At Booborowie Experimental Farm one plot shows a bushel per acre increase for the addition of potash, but on the other it has no effect. At Turretfield Experimental Farm, although the plots were located on the heavy-textured soil which usually contains so much potash, the addition of ½cwt. sulphate of potash per acre to superphosphate led to a consistent increase of about 2bush. per acre to the wheat crop. The most interesting results from the use of potash shown in the table are those from Smoky Bay, where the addition of potash alone had a depressing effect on the wheat yield, the treated plot giving less than the unmanured plot, and where it was added to superphosphate it proved without effect, and this behaviour in a soil extraordinarily deficient in potash. The soils of the Smoky Bay district are calcareous sands showing on analysis 40 per cent. to 46 per cent. of lime. Of the principal plant foods, they contain about 0·1 per cent. of phosphoric acid, from 0·1 per cent. to 0·3 per cent. of nitrogen, and practically no potash in the first 12in. of soil. Of six samples analysed, one contained no potash, three only showed a trace, one contained 0·019 per cent., and another 0·15 per cent., which is a very unusual happening in South Australia, and one that would naturally lead to the assumption that potassic fertilisers would be required before crops could be expected.

Even though potash has a marked effect on the quality of barley, it does not appear at present to be at all likely that additions of potassic fertilisers will have any effect on either the yield or the quality of the barley crops grown in the districts recognised as being really suitable for this crop.

"COMPLETE" MANURES FOR CEREALS.

In the older agricultural countries of the world, and particularly in those receiving plenty of rain, it is usual practice to add phosphates and nitrogenous manures to all cereal crops, and in a great many places complete manures, *i.e.*, those containing potash as well as nitrogen and phosphorus, are used for these crops. The effect of these manures on cereals in this country is much as would be expected after seeing the yields secured by adding nitrogen or potash individually with superphosphate. The mixture of manures just gives a slight increase, but a long way from an economic one, as can be seen in the next table.

TABLE XVIII.—*Effect on Wheat of Nitrogen, Potash, and Phosphoric Acid in Conjunction in South Australia.*

Location.	Period.	Yield of Wheat per Acre per Year.					
		No Manure.	1cwt. Super.	2cwts. Super.	Super. and ½cwt. Nitrate of Soda and ½cwt. Sulphate of Potash.	Super. and ½cwt. Nitrate of Soda and ½cwt. Muriate of Potash.	Super. and ½cwt. Sulphate of Ammonia and ½cwt. Muriate of Potash.
	Years.	B. L.	B. L.	B. L.	B. L.	B. L.	B. L.
Roseworthy	5	9 38	13 36	—	—	—	13 16
Booborowie	13	19 25	—	28 6	—	28 56	—
Veitch ...	9	11 34	13 48	—	14 29	—	—
Turretfield.	5	13 0	—	16 3	17 55	—	—

FARMYARD MANURE FOR CEREALS.

In Europe and other countries with similar climate farmyard manure forms the base of all manuring, and when utilised in rotations which include cereal crops it has a marked beneficial effect on the cereal crops. Soils with a relatively low content of organic matter do not grow cereals nearly as well as those adequately supplied, and any shortage must be made good by applications of farmyard manure or by green manuring. In countries with a Mediterranean climate the position is quite different, and cereals do better in soils not too well provided with organic matter, and the addition of farmyard manure to the land does not favor these crops, as can be seen in the next table:—

TABLE XIX.—*Wheat Grown with Farmyard Manure in South Australia.*

Location.	Period.	Yield of Wheat per Acre per Year.				
		No Manure.	2cwts. Super.	Farmyard Manure Alone.	Farmyard Manure and 2cwts. Super.	Farmyard Manure and 2cwts. Super and ½cwt. Sulphate of Potash.
	Years.	B. L.	B. L.	B. L.	B. L.	B. L.
Roseworthy	16	11 34	17 10	12 43	18 28	19 51
Booborowie	13	19 25	28 6	27 20	28 59	29 26
Turretfield	5	13 0	16 3	15 0	14 43	16 4

NOTE.—Farmyard manure applied at the rate of 14 tons per acre at Roseworthy and 10 tons per acre at other places.

At both Roseworthy Agricultural College and Turretfield Experimental Farm applications of farmyard manure alone give only a very slight increased yield over and above the crops grown without manure of any kind, whereas at Booborowie Experimental Farm it increases the yield by over 8bush. per acre, but even this increase would not pay for the cost of the manure. In all cases the yield of grain is less where farmyard manure is used alone, than where 2cwts superphosphate (36 per cent.) per acre is applied. The addition of farmyard manure, or of farmyard manure and sulphate of potash to the ordinary dressing of superphosphate, does not materially increase the yield of grain of wheat crops.

Farmyard manure increases the yield of cereal hay to a slightly greater extent than it does the grain, but the quality of the hay is considerably reduced because of the presence of so many weeds brought to the land by the manure.

LIME AND GYPSUM FOR CEREALS.

Both lime and gypsum are good *soil amendments* and fairly powerful *indirect fertilisers*, liberating much plant food, and in many places reducing the quantities of direct fertilisers which would otherwise be needed. Where it is necessary to correct poor mechanical condition of a soil by the use of one or other of these substances, a general toning up of the land, usually results, and better crops follow, but neither of them do much as direct fertilisers. The only places where field experimental work with these substances have been conducted in South Australia are at Roseworthy, Booborowie, and Turretfield, all of which are sufficiently well supplied with lime to give good crops without additions of it. The results secured at these places are set out in the following table :—

TABLE XX.—*Effect of Lime and Gypsum on Wheat in South Australia.*

Location.	Period.	Yield of Wheat per Acre per Year.				
		No Manure.	2cwts. Super.	2cwts. Super. and 5cwts. Lime.	2cwts. Super. and 5cwts. Gypsum.	2cwts. Super. and 4cwts. Gypsum.
	Years.	B. L.	B. L.	B. L.	B. L.	B. L.
Roseworthy	16	11 34	17 10	20 20	—	—
Roseworthy	5	9 38	12 41	15 51	13 58	—
Booborowie	13	19 25	28 6	28 40	—	27 39
Turretfield	5	13 0	16 3	17 51	—	18 9

The increased yields due to the addition of lime to land which is also manured with superphosphate is seen, in the table, to be about 3bush. per acre at Roseworthy Agricultural College, nearly 2bush. at Turretfield Experiment Farm, but practically nothing at Booborowie Experimental Farm. Gypsum has had little beneficial effect except at Turretfield where it increased the yield by about 2bush. per acre. In no place was the increase anywhere nearly enough to pay for the addition.

PHOSPHORIC ACID FOR CEREALS.

Of the principal mineral plant foods likely to be supplied to cereals as manure, phosphoric acid is the only one not yet discussed. It has been shown that nitrogen, potash, organic matter, lime and gypsum, or combinations of them are not highly beneficial to this type of crop in South Australia, but the position is quite different where phosphoric acid is concerned. Most Australian soils are notoriously deficient in phosphoric acid, and almost without exception additions of manures containing this plant food give very large increases to the yields of all annual plants, and most assuredly with the cereals. It is generally recognised now-a-days that it is courting disaster to attempt to grow cereals without applying a phosphatic fertiliser with the crop. So much is this so in South Australia, that over 93 per cent. of the total area cropped each year is fertilised with a phosphatic manure, and over 180,000 tons of phosphatic fertilisers are used in the State annually.

Annuals require their phosphoric acid in soluble form, because they absorb most of it while they are young, and as the only water-soluble form of phosphatic fertiliser is superphosphate, this is easily the most important manure for the cereals.

There is another phosphatic manure known as basic slag, which is fairly soluble, at all events in weak acids, and so to some extent in soil moisture, which is an important fertiliser in places where it is readily obtainable at a reasonable price. Basic slag has been tested to some extent in this State, in comparison with dressings of superphosphate, and the results at our disposal are presented in the next table :—

TABLE XXI.—*Results from Wheat Dressed with Basic Slag in South Australia.*

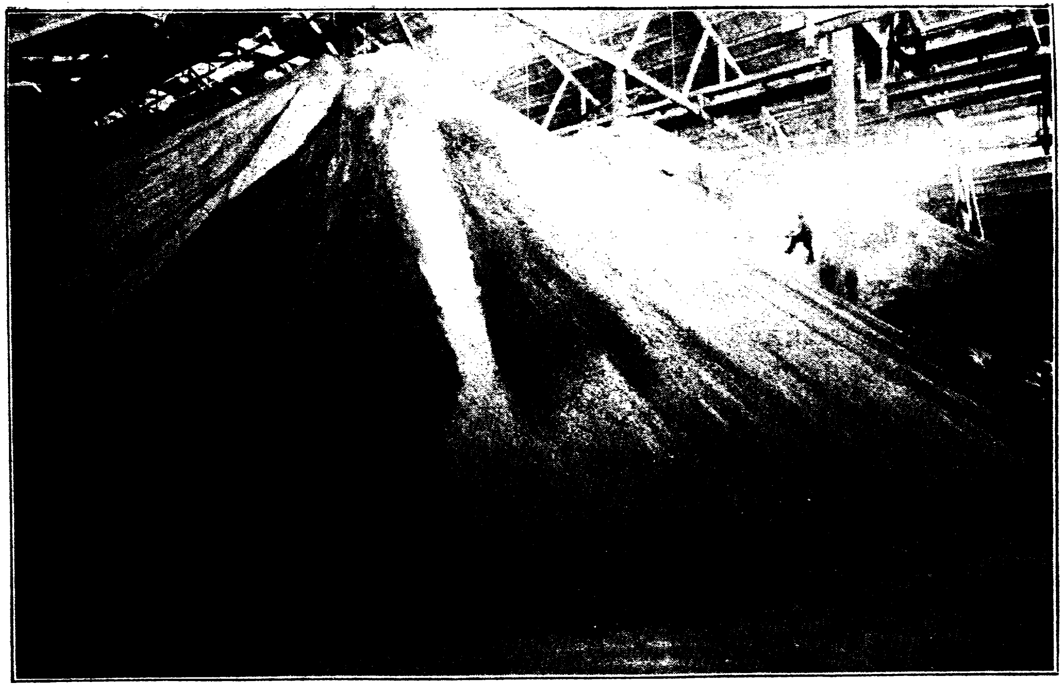
Location.	Period.	Yield of Wheat per Acre per Year.											
		No Manure.		1cwt. Super.		2cwts. Super.		1cwt. Basic Slag.		2cwts. Basic Slag.		3cwts. Basic Slag.	
	Years.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Roseworthy	22	13	2	16	58	18	56	—		16	14	17	21
Booborowie	13	19	25	26	22	28	6	26	46	27	58	—	
Turretfield.	5	13	0	15	11	16	3	16	36	16	12	—	

The figures in the table show that in the heavy-textured soils of Booborowie and Turretfield Experimental Farms, a dressing of 1cwt. per acre of basic slag is quite as good for wheat as is a similar dressing of superphosphate, but in neither place, nor at Roseworthy Agricultural College, does a 2cwt. dressing of basic slag equal a 2cwt. dressing of superphosphate. If conditions regarding the supply of this fertiliser were similar here as in Europe, i.e., readily obtainable at about the same price as superphosphate, we would be able to seriously consider the using of this manure for certain soils and in wet districts, but as basic slag is not made in the country, and must be imported, it is far too dear by the time it is distributed to growers to have any chance of competing with superphosphate as an economic dressing for cereal crops.

SUPERPHOSPHATE FOR CEREALS.

To most people in this State who are at all interested, the term *manuring* means the putting of superphosphate into the soil, and plenty of them do not know anything about other forms of artificial manures. Such staggering results followed the use of superphosphate on the worn out unmanured wheat lands of the country, that its use spread with great rapidity, and within a few years of its first introduction most wheat growers had tried it, and very few discontinued its use. The discovery of the marvellous efficacy of superphosphate in South Australian soils forms one of the most important happenings since the original settlement of the State. It put farming on a profitable basis, and its introduction was the beginning of our principal agricultural progress.

In the early days of the use of superphosphate very light dressings were used, in many cases below 56lbs. per acre, but with the advancement of time the average dressing of superphosphate per acre has gradually increased throughout the wheat-growing areas. That the increased dressings have come fairly rapidly can be realised if it is remembered that as recently as 1915 there was a fair sprinkling of farmers in some of our Lower North districts who had never used more than 60lbs. of superphosphate (36 per cent.) per acre with wheat on fallowed land. In some of these districts at the present time, the average dressing of superphosphate applied to all annual crops grown, including oats, barley, and peas, is over 100lbs. per acre, and most of the manure is what is known as 45 per cent. grade. The dressing for all annual crops sown in the whole of county Light has reached 117lbs. superphosphate per acre; in county Gawler, 112lbs.; and in county Fergusson, 109lbs. per acre, and these fairly high dressings mean that some farmers are using around about 2cwts. superphosphate per acre with their wheat crops.



MATURING OF SUPERPHOSPHATE.

Superphosphate is made by treating insoluble calcium phosphate with sufficient sulphuric acid to convert the great bulk of the insoluble phosphate to a soluble form. The mixing is done mechanically, and much heat is developed during the reaction between the two substances. After mixing, the hot mass is dropped to a lower floor, where the reaction is completed during storage in large heaps.

The illustration shows a large heap of superphosphate in a South Australian factory, stored for the completion of the reaction, the dark portion in the foreground being some of a fresh mixture just run on to the more mature and light-colored mass.

The next table gives the wheat yields secured in various parts of the State from different dressings of superphosphate :—

TABLE XXII.—*Yields of Wheat Grown with Various Dressings of Superphosphate.*

Location.	Average Annual Rainfall.	Period.	Mean Yield per Acre.							
			No Manure.		* Super. per Acre.					
					½cwt.		1cwt.		2cwts.	
	In.	Years.	B.	L.	B.	L.	B.	L.	B.	L.
Roseworthy	17·85	17	11	15	16	27	17	52	17	50
Veitch	12·08	14	12	41	13	41	15	20	16	25
Booborowie	17·82	13	19	32	24	28	26	22	28	6
Minnipa	13·81	13	12	9	16	29	17	40	18	59
Butler	15·00	9	10	13	15	38	17	43	21	6
Yurgo	14·00	6	11	37	21	8	22	59	26	40
Turretfield	18·11	5	12	59	15	32	15	11	16	2
Wilkawatt	16·00	4	5	57	6	56	8	13	10	19
Sandalwood	13·90	3	2	53	6	25	8	6	9	56
Kimba	14·92	3	7	28	10	24	10	31	11	53
Rudall	12·14	3	4	15	9	3	11	11	11	50
Ungarra	16·85	3	16	12	23	11	25	17	27	54
Appila	15·01	3	6	36	9	41	10	22	10	40
Nelshaby	14·50	3	8	52	9	43	9	55	10	45
Urania	19·00	3	7	6	9	16	12	41	13	46
Smoky Bay	10·61	3	14	50	16	9	16	25	18	55
Copeville	11·58	1	1	0	4	53	8	7	8	3
Coorabie	12·00	1	Nil		0	36	1	31	5	26
Cortlinye	12·00	1	0	51	2	40	3	14	2	15
Means (108 crops)	—	—	11	28	15	26	16	53	18	20

* 36% superphosphate.

The results shown in the table were secured from 19 wheat-growing districts of the State, with average annual rainfalls varying from just over 10½in. to about 19in., and they show a consistent increase in the wheat yield as heavier dressings of superphosphate are applied. Perhaps the mean results can be realised more fully if a money value is put on the increases obtained.

TABLE XXIII.—*Value of Increased Wheat Crop from the Use of Superphosphate.*

	No Manure.		* Super. per Acre.					
			½cwt.		1cwt.		2cwts.	
	B.	L.	B.	L.	B.	L.	B.	L.
Mean Yield (108 crops)	11	28	15	26	16	53	18	20
Increase over no manure	—		3	58	5	25	6	52
†Value of increase	—		11/7½		14/5½		15/0½	

* 36% superphosphate. † Superphosphate at 4/6 cwt., wheat at 3/6 bushel.

These figures show that when wheat is worth 3s. 6d. per bushel and superphosphate (36%) can be purchased for 4s. 6d. per cwt. the application of ½cwt. of superphosphate per acre gives an increased yield of 3bush. 58lbs. per acre, worth 13s. 10½d. for an outlay of 2s. 3d. per acre. A dressing of 1cwt. of superphosphate per acre increases the yield by 5bush. 25lbs. per acre, worth 18s. 11¼d.

for the expenditure of 4s. 6d. per acre ; and putting 9s. worth of superphosphate per acre with wheat in South Australia increases the yield by 6bush. 52lbs. per acre, and worth 24s. 0½d. per acre extra because of the manure. The results are in sharp contrast with those received from the use of other kinds of manures, and they show that relatively light and cheap applications of superphosphates give quite appreciable profits for a small outlay, and that the increases are general throughout the wheat-growing districts of the State.

In most of the cereal-growing districts which have been settled long enough to enable farmers to clear the land of stumps and stones, and where the average annual rainfall exceeds 14in., it is usual to give applications of from ¾cwt. to 1cwt. superphosphate per acre with wheat crops, but because a 20bush. crop of wheat, and its equivalent of oats or barley, will utilise all of the phosphoric acid supplied in ¾cwt. superphosphate (45%) this quantity should be considered as the absolute minimum application of phosphatic fertiliser. If the fertility of the land is to be increased, more than this minimum quantity must be used with every crop sown, particularly where many livestock are carried, because a considerable amount of phosphoric acid is removed in wool, milk, and the carcasses of slaughtered animals as well as by the crops. In a general way it can be stated that all cereal crops grown on average soils in fairly good wheat-growing conditions should be dressed with at least the equivalent of 1cwt. superphosphate (45%) per acre, and when any cereal crop is to be followed by pasture, or another crop not to be manured, the dressing of superphosphate should be increased. In the better wheat-growing districts of the State where heavy-textured soils are the rule, and where the average annual rainfall exceeds 17in., the dressing of superphosphate should not be less than 1½cwts. per acre, and 2cwts. per acre would prove even more profitable. In the low rainfall districts where wheat is grown less superphosphate will be used, and probably ¾cwt. per acre with each crop will be sufficient.

Where rotations such as (*a*) bare fallow—wheat—pasture, or (*b*) bare fallow—wheat—oats or barley—pasture, or (*c*) bare fallow—wheat—peas—wheat—pasture, are practised, superphosphate is the only manure necessary at present, and it is extremely difficult to see when any other fertilisers will be required in conditions such as ours.

What has been said for the manuring of wheat crops applies equally for oat crops. When grown for hay on fallowed land liberal applications of superphosphate are necessary, and in the better agricultural districts these should approach 2cwts. per acre. When grown for grain, as a stubble crop, climatic conditions control the dressings of manure, and in good districts these may be from 1cwt. to 1½cwts. per acre, whilst in places of lower rainfall the amounts used would vary from 60lbs. to 90lbs. per acre.

The position with barley crops is slightly different, in that quality of grain is of great importance, and good quality is rarely secured if the plants are very luxuriant. Because of this risk of over-stimulating the barley crops, from the point of view of the production of good quality grain, growers rarely use more than 1cwt. superphosphate per acre for barley, and it is more usual to apply about 80lbs. to 90lbs. per acre.

In connection with the manuring of cereals there has been an idea prevalent in all districts in a certain stage of their development that the crops will be " blighted " by liberal dressings of superphosphate. The term " blighting " is generally applied to that trouble with wheat crops when the moisture is dried out of the plants quicker than the roots can make it good, and is usually characterised by the plants going straight from the green to the dry stage without showing the natural changes of color which accompany normal ripening. In a mild attack the grain is badly pinched ; in bad cases the plants dry out in a few days to a whitish color and become very light in weight, and there may be all stages between these two extremes.

Even in a mild attack of "blighting" there is a considerably decreased yield, and a much reduced weight per bushel of the grain harvested, and as the records of experiments conducted with superphosphate on cereals throughout the State show no evidence of either reduced yield or lowered weight per bushel, we can only conclude that this occasional trouble of cereal crops has some other cause. The erroneous idea appears to have had its rise in the fact that much of our farmed land, when originally opened up for cropping, was excessively rich in organic matter, which substance will lead to the "blighting" of the cereals. The extreme case in this connection is of common occurrence, for where hay has been stacked it is usual for the first three or four cereal crops grown on the site after the land has again been brought under crops to "blight" very badly. The same thing applies to old sheep camps and all places where there is an excess of organic matter in the soil.

It appears that "blighting" of cereal crops is never directly due to applications of superphosphate, no matter how heavy the dressings, and the sooner this is realised, the more rapid will be the advance towards the utilisation of the most profitable dressings of this fertiliser.

MANURIAL DRESSINGS FOR LEGUMINOUS CROPS.

Well-grown leguminous crops, such as crops of lucerne, peas, clovers, beans, &c., collect more of the mineral matters from the soil than do the cereals, still in most places where these crops are successfully grown in Australia, it has so far been necessary only to add phosphatic fertilisers to them. The requirements of these crops for potash and lime are great, and in most countries it is necessary to make certain that the soils are well supplied with these substances; but in most parts of Australia applications of potassic fertilisers have not proved profitable, although additions of lime are often benefical. In some of the districts of South Australia, where climatic conditions are sufficiently good to grow payable crops of peas, beans, and clovers, the soils are fairly sour, and the correction of this acidity by applications of lime encourages the growth of all of the kinds important to us, with the single exception of subterranean clover.

Lucerne only grows really well where the soils are well provided with lime, and then only requires the addition of superphosphate of the mineral fertilisers, but benefit always follows the addition of farmyard manure, particularly if the crop is being irrigated. In good lucerne-growing conditions a dressing of 2cwts. superphosphate (45 per cent.) per acre per year should be given, but smaller amounts would be applied as the conditions become less favorable for the growth of the crop, until as little as 56lbs. per acre per year would be used on the sandy soils of the mallee districts. Farmyard manure can be applied at any time of the year when the application will not foul the growth, and dressings from 10 tons to 30 tons per acre every few years do a power of good to the crop. When being grown in soils rather deficient in lime, as are some of our soils in districts receiving more than 22in. of average annual rainfall, a dressing of about 2 tons of slaked lime per acre should be applied before seeding the crop, and an application of from 10cwts. to 1 ton per acre be given every four years or so.

Subterranean clover cannot be grown successfully in this State unless phosphates are applied, and in those places where the climate is suitable for this crop, at least 1cwt. superphosphate per acre per year, or its equivalent in other phosphates, should be added, and in most places doubling this quantity still proves an economic proposition. Other clovers are only grown to a limited extent as yet, but their requirements for phosphoric acid are as great as those of lucerne and subterranean clover, and as the presence of lime assists all of them, a shortage of this substance should be made good.

Peas, beans, and such-like leguminous crops, only do well when plenty of lime and phosphoric acid are present, so if the soils in which these crops are to be grown are at all sour, the trouble should be corrected with lime, and in all conditions from 1cwt. to 2cwts. of superphosphate (45 per cent.) per acre should be applied with the seed.

FERTILISING ROOT CROPS.

The root crops, including such crops as cabbages, kale, rape, silver beet, &c., which require similar treatment, are greedy feeders, as can be expected from the great bulk of growth made, and they remove much mineral matter from the soil.

Where at all possible, applications of farmyard manure should be given to land which is to carry a root crop, and if this is supplemented by fairly heavy dressings of fertilisers containing mineral matters, very large crops can be secured. If a dressing of 20 tons farmyard manure per acre is given to the land before seeding to a root crop, 2cwts. superphosphate and 1cwt. sulphate of ammonia per acre should suffice, although for some of the kinds of roots the addition of lime is advantageous. Where lime is required, about 10cwts. of slaked lime per acre should be applied once every four years or so. If farmyard manure is not available, the root crop should receive 3cwts. to 4cwts. superphosphate and 1½cwts. of a nitrogenous fertiliser per acre, or as is sometimes practised, one or two crops in a four or five course rotation of crops are grazed off by livestock to make up the organic matter content of the soil, and the root crop is manured with from 6cwts. to 10cwts. of superphosphate per acre. In some manurial experiments on potatoes, grown in a four-course rotation, receiving 10cwts. lime per acre once in four years, which were conducted for several years at Mount Barker in this State, it was found that applications of 8cwts. superphosphate per acre, or 4cwts. superphosphate and 2cwts. dried blood per acre gave profits for the manuring which were about equal, and these were much higher than for any other form of manuring. Where irrigation facilities are available some potato growers in this State use more than 10 cwts. superphosphate per acre, but such dressings would hardly prove profitable for other types of root crops, unless it be for mangels, in a few very favorable locations.

MANURES FOR OTHER SUMMER CROPS.

The summer crops which make very rapid growth in the hot part of the year, such as maize, sorghum, millet, sunflowers, &c., require really fertile soils, or the application of active forms of the various fertilisers, if they are to make the luxuriant growth of which most of them are capable.

When grown for forage purposes, in rotation with other types of crops, the land should receive an application of farmyard manure, at the rate of about 20 tons per acre, once every four years or so, and it should be given when preparing the land for the summer crop, whilst at the time of seeding a dressing of 2cwts. to 3cwts. superphosphate per acre should also be given. When insufficient farmyard manure is available, a nitrogenous fertiliser should be used as well as the phosphate, such as 1cwt. to 2cwts. per acre of sulphate of ammonia or nitrate of soda.

When grown for grain, the same luxuriance of growth is not required; still, farmyard manure is helpful, but in most of the fertile soils which suit these crops, dressings of 2cwts. to 3cwts. per acre of superphosphate will be all that are required, provided that the one type of crop is not grown too often on a given block of land. In heavy clayey soils, and in those that are peaty, applications of lime aid these crops to a marked extent, and the dressings should be about 10cwts. per acre every fourth year.

MANURING PASTURES.

In those countries where pasture lands are well cared for, and where considerable work has been done in manuring experiments, it is recognised that the manuring of pastures is a much simpler operation than was previously considered necessary, and for the great majority of cases it can be stated that the manuring of pastures

SUPERPHOSPHATE READY FOR BAGGING.

After the completion of the reaction between sulphuric acid and insoluble calcium phosphate has taken place, the superphosphate is lightly cemented together in a more or less solid mass. It is dug out, crushed, and placed in a fresh heap in store, where it is kept until bagged for transporting to farmers. The illustration shows a large heap of recrushed superphosphate ready for bagging.

consists in supplying phosphoric acid and, in a few cases, lime. A good growth of pasture plants, whether in sown or so-called natural pasture, will utilise annually all the phosphoric acid available in a dressing of 1cwt. superphosphate per acre, and so all pasture lands located in districts with sufficient rainfall to produce good pastures, say, 22in. or more of average annual rainfall in South Australia, shoud receive the equivalent of at least 1cwt. superphosphate per acre, per year. It is a proved fact in the manuring of pastures that more economical results are secured if heavy applications of fertilisers are given seldom, rather than light applications often, and this is particularly so in Australia where most of our soils are very deficient in phosphoric acid. At present-day prices for phosphatic fertilisers it is more economical to apply a mixture of 1cwt. superphosphate (45%) and 10cwts. raw rock phosphate (82%) per acre once every 12 years or so than to distribute annually 1cwt. superphosphate per acre. On the other hand, this system of manuring requires that a good deal of money be available, and such money must be "locked up" in the land for a number of years, and so with many landholders it is easier to finance an annual dressing of superphosphate than to spend a lot of money on fertilisers now and again.

In fairly fertile soils in this country, located in districts receiving 22in. of average annual rainfall or more, pastures should be dressed with the equivalent of 1½cwts. to 2cwts. superphosphate per acre per year. In soils very deficient in lime, in heavy clays, and in peaty soils a dressing of at least 10cwts. per acre of lime should be given every four or five years as well as the phosphatic manures. In European countries basic slag is the phosphatic fertiliser which gives best results on most pasture lands, and particularly so on heavy, wet, clayey soils, the application being from 10cwts. to 1 ton per acre every few years. In Australia, however, basic slag is imported, and is much more expensive than its agricultural value warrants, and, provided that raw rock phosphate is finely ground, it gives quite good returns in districts where sufficient rainfall is received.

In recent years much has been written, printed, and talked about in connection with the efficacy of nitrogenous fertilisers on pastures, combined with the practice of rotational grazing of the pastures. Despite the almost continuous propaganda, it has yet to be proved that it is an economic proposition in this country to use expensive dressings of nitrogenous fertilisers several times in a season, closely subdivide the pastures into extremely small fields, provide the necessary protection and watering places in all these fields, and continually move the principal livestock and the followers from field to field. It is claimed by the advocates of the system that heavy dressings of nitrogenous fertilisers (and in this country sulphate of ammonia is generally indicated), of 2cwts. to 4cwts. per acre, split up into three or four dressings given to the pasture land during the growing season, will provide more and cheaper protein for milk-supplying animals than will any other system of manuring, provided that the pasture plants are never allowed to exceed a few inches in height before being fed off. The principal animals of the herds, usually milking cows, are put on to the pastures when the plants are about 4in. to 6in. in height, allowed to graze there for three or four days, and are then moved to the next field, when animals called "followers," usually heifers and steers, are put in the field to closely graze down the pastures. As six or seven fields are grazed in rotation the stock are only on each block a few days, and it is then rested for some time. For instance, if the principal animals are on the pastures for four days and the followers clean up in one day, each block will be grazed for five days, and rested for 19 days or 23 days, according as there are six or seven fields being utilised. This system of pasture improvement started in Germany, and became popular during the war, when nitrogen was available but phosphates very difficult to come by; from there it spread to Great Britain, and has been taken up fairly keenly in some quarters in New Zealand, but on the published statements of results it can still be said that it is in the experimental stage, and much more work is necessary before the recognised method of producing protein in pastures is discontinued. To date the proved method of securing protein is to encourage the growth of leguminous pasture plants by liberal applications of phosphates, and so far there are no authentic published results which would lead, in South Australia, to the replacement of this method of pasture improvement by other systems of manuring. Supplying plenty of nitrogenous manure to pasture increases the bulk, and, if sufficient rainfall is received, extends the period during which the plants remain green, and provided that the plants are fed off when very young a lot of protein is obtained, but at a cost that requires a lot of increased return of saleable animal products to make up. In Australia at all events, and in many other places as well, it still remains necessary to use phosphates for the grazing animals, even if nitrogen is applied to the pastures, and these phosphates used as manures on the pasture are collected by the animals in the plants, after having done the work of encouraging legumes to manufacture the required protein.

FERTILISERS FOR VINES AND FRUIT TREES.

A considerable amount of experimental work in the fertilising of vines and fruit trees has been carried out in most countries where these crops are grown at all extensively, but the results are so contradictory that it is quite impossible to lay down hard and fast rules for the manuring of them. There are not many countries where manuring tests on fruits have shown direct profits, except for vines, citrus fruits, and peaches. In poor soils complete manures containing nitrogen, potash, and phosphoric acid often lead to great improvement in vines, and in many places phosphates alone benefit this crop. Citrus fruits, and particularly oranges, are much improved in general vigor and in quantity and quality of the fruits by additions of nitrogenous manures, even when the organic matter content of the soil is adequately kept up. For the purpose sulphate of ammonia is very suitable, and can be profitably applied at the rate of 8lbs. to 10lbs. per tree, divided into two or three applications. Peaches also are frequently benefited to a considerable extent by additions of nitrogenous fertilisers, both the quality and color of the fruit being improved.

Young vines and fruit trees usually show a marked improvement when regularly manured, and for average conditions a fertiliser containing the following percentages of the required plant foods is suitable :—

Nitrogen—5 per cent.
Potash—6 per cent.
Phosphoric acid—12 per cent.

Such a fertiliser would be made by mixing—

150lbs.	sulphate of ammonia
352lbs.	supherphosphate (45 per cent.)
72lbs.	muriate of potash
26lbs.	sand
600lbs.	total

It should be applied at the rate of 6lbs. per tree, or 1lb. to every 8 sq. yds. for vines, preferably in two applications rather than putting the whole lot on the land at one time.

Old vines and fruit trees that are in need of manuring usually require different proportions of the fertilising materials, and a mixture which often proves satisfactory is one containing :—

Nitrogen—3 per cent.
Potash—6 per cent.
Phosphoric acid—15 per cent.

A fertiliser containing these proportions would be made by mixing—

90lbs.	sulphate of ammonia
440lbs.	superphosphate (45 per cent.)
72lbs.	muriate of potash
602lbs.	

It would give good results if applied at the rate of 7lbs. or 8lbs. per tree, or 2lbs. to every 13 sq. yds. of vineyard.

In all soils not really rich in organic matter, it is good practice, and in some cases a necessity, to apply organic matter to the vineyard or orchard if maximum returns are to be secured. In a country like Australia, where farmyard manure is difficult to obtain, the best way to provide this organic matter, and at the same time fertilise the land, is to grow luxuriant crops between the rows of vines or trees, and plough them into the land as green manure. For the purpose, tick beans, field peas, King Island melilot, mustard, cereals, or any other succulent crop which can be grown successfully in the locality, are suitable crops, and if sown with a dressing of 3cwts. or 4cwts. superphosphate per acre, and ploughed into the land whilst still soft and sappy, a very marked improvement to the mechanical condition of the soil, and to the growth and vigor of the vines or trees is the result. This green manuring is a necessity in sandy soils, particularly where irrigation is practised, and also greatly improves soils of heavy texture.

MANURES FOR SPECIAL PURPOSES.

Although the fertility of the land can readily be maintained when ordinary cropping is being practised, or even where intense culture is carried out, some few crops need special manurial treatment to supply their needs, and keep the soil in good heart, and so it is as well to remember that—

Phosphoric Acid should be supplied to the soil for all crops, because practically no soils are naturally well supplied with this plant food.

Nitrogen encourages luxuriant growth, and so all plants having greatest value in their leaves and stems should be well supplied with this substance.

Potash promotes the formation of flowers, seeds, bulbs, fruits, nuts, &c., and adds to the general hardiness and disease-resistance of plants.

A plentiful supply of *organic matter* and *lime* in the soil allows plants to make maximum growth with less manure, because the bacteria increase their activities and liberate much nitrogen, and lime frees some of the potash held in combination.

AIDS TO SUCCESSFUL MANURING.

Manuring of plants is only one of the necessities tending towards full crop returns, and without the others would be uselsss. The better the general crop growing conditions, the greater are the results secured from the use of manures.

The soil must be well supplied with organic matter to keep it in good mechanical condition, to control the moisture and warmth, and to make it a suitable medium for bacteria.

The soil must be well supplied with lime to counteract excessive acidity, encourage bacteria, and liberate other plant foods.

The soil must be well drained, otherwise the excess water keeps it cold, prevents the easy access of air, and does not allow the roots of plants to travel far in search of their requirements.

The soil must be kept well aerated, as the roots of plants are in need of air, so are the bacteria, and the presence of air does much towards the liberation of plant foods.

The soil must be well supplied with water by rain or irrigation, because it is from the soil that plants secure their water, and their requirements in this direction are really enormous.

LIQUID MANURE.

Liquid manure made by diluting the dark-colored liquor which drains from the farmyard manure heap, or by steeping animal droppings in water, is a stimulant for many kinds of plants, and when being applied should be made very dilute, and be poured on at the rate of about a gallon to the square yard.

A good liquid manure for forcing plants can be made with mineral fertilisers by thoroughly mixing 1½oz. superphosphate, ½oz. sulphate of potash, 1½oz. nitrate of soda in a kerosene tin of water, and applying it to three or four square yards of soil.

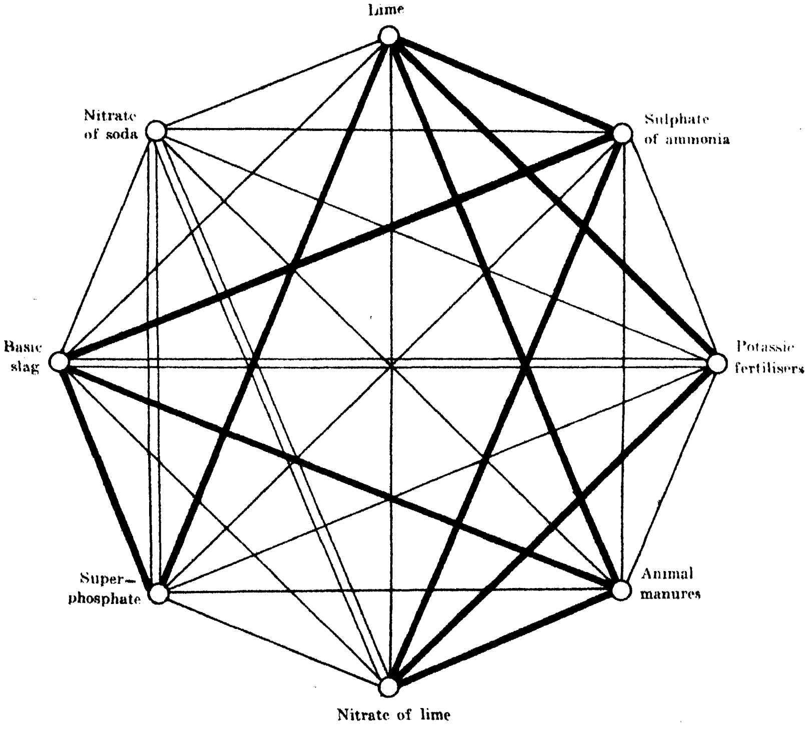
MIXING FERTILISERS.

All fertilisers cannot be mixed indiscriminately without in some cases incurring losses of available plant food or affecting the mechanical condition of the mixture. Some mixtures lead to trouble by—(1) loss of nitrogen as ammonia; (2) reversion of soluble phosphates; or (3) by producing unfavorable mechanical condition. In this connection it is always to be remembered that the following fertilisers should never be mixed :—

Lime and nitrate of lime must not be mixed with sulphate of ammonia, muriate of potash, kainit, superphosphate, animal manures, guano.

Basic slag must not be mixed with sulphate of ammonia, animal manures, guano.

DIAGRAM ILLUSTRATING THE MIXING OF MANURES.



Thick black line connects manures which must not be mixed together.
Double line connects manures which must only be mixed immediately before use.
Single thin line connects manures which may be mixed together at any time.

UNIT SYSTEM OF VALUING FERTILISERS.

Fertilisers are usually valued on what is known as the unit system, and in this a unit of any of the fertilising substances is taken as 1 per cent. per ton. For instance, the sulphate of ammonia at present on the market contains 20 per cent. nitrogen, and so it is taken that 1 ton of sulphate of ammonia contains 20 units of nitrogen, and, as this material costs £13 per ton, each unit of nitrogen in sulphate of ammonia is worth 13s. The same method of valuation is applied to all fertilisers, and as it is compulsory for manure merchants to provide the analysis of every manure offered for sale, a knowledge of unit values of the various fertilising substances enables the user to know exactly what he is paying for the ingredients in the fertilisers that are useful for his crops.

UNIT VALUES IN SOUTH AUSTRALIA.

The unit value of the various fertilising substances changes with the fluctuations of the market, but is easily calculated when the analysis of the manure is known. The commercial value of the fertiliser is governed by the law of supply and demand, but the agricultural value is not always equal to the commercial cost, and so every user of fertilisers has to decide what will give the biggest profits in his particular conditions.

At present—1932—the unit values of the principal fertilisers on our market are—

TABLE XXIV.—*Unit Costs of Some Present Offerings, Adelaide, 1932.*

POTASSIC FERTILISERS.

Fertiliser.	Potash.	Cost per Ton.	Unit Cost.
	%	£ s. d.	£ s. d.
Sulphate of potash	48·0	15 12 6	0 6 6
Muriate of potash	50·0	13 2 6	0 5 2

NITROGENOUS FERTILISERS.

Fertiliser.	Nitrogen.	Cost per Ton.	Unit Cost.
	%	£ s. d.	£ s. d.
Nitrate of soda	15·5	16 12 6	1 0 8
Sulphate of ammonia	20·0	13 0 0	0 13 0
Blood manure	13·0	16 12 6	1 3 9

PHOSPHATIC FERTILISERS.

Fertiliser.	Calcium Phosphate.	Kind of Phosphate.	Cost per Ton.	Unit Cost.
	%		£ s. d.	£ s. d.
100% super.	100	Water soluble	11 0 0	0 2 2
48% super.	48	Water soluble	4 15 0	0 2 0
45% super.	45	Water soluble	4 10 0	0 2 0
Raw rock phosphate	82	Acid soluble	4 17 6	0 1 2
Basic slag	31	Total	6 5 0	0 4 0

COMPOUND FERTILISERS.

Fertiliser.	Cost per Ton.	Fertilising Constituents.		If Unit Value is	Unit Cost will be
	£ s. d.		%	s. d.	£ s. d.
(a) Bonedust	6 12 6	Nitrogen	3·25	18 0	—
		Acid sol. phosphate ..	40·00	—	0 1 10
(a) Bonedust	6 12 6	Nitrogen	3·25	—	1 2 4
		Acid sol. phosphate ..	40·00	1 6	—
(b) Bone manure ...	8 12 6	Nitrogen	7·50	18 0	—
		Acid sol. phosphate ..	25·00	—	0 1 6
(b) Bone manure ...	8 12 6	Nitrogen	7·50	—	0 18 0
		Acid sol. phosphate ..	25·00	1 6	—
(c) Complete manure	9 2 6	Nitrogen	5·00	18 0	—
		Potash	4·50	—	0 8 11
		Water sol. phosphate.	18·00	2 0	—
		Citrate sol. phosphate	6·00	1 9	—
		Acid sol. phosphate ..	4·00	1 6	—
(c) Complete manure	9 2 6	Nitrogen	5·00	—	1 1 1
		Potash	4·50	5 6	—
		Water sol. phosphate.	18·00	2 0	—
		Citrate sol. phosphate	6·00	1 9	—
		Acid sol. phosphate ..	4·00	1 6	—
(c) Complete manure	9 2 6	Nitrogen	5·00	18 0	—
		Potash	4·50	5 6	—
		Water sol. phosphate.	18·00	—	0 2 10
		Citrate sol. phosphate	6·00	1 9	—
		Acid sol. phosphate ..	4·00	1 6	—
(c) Complete manure	9 2 6	Nitrogen	5·00	18 0	—
		Potash.............	4·50	5 6	—
		Water sol. phosphate.	18·00	2 0	—
		Citrate sol. phosphate	6·00	—	0 4 3
		Acid sol. phosphate ..	4·00	1 6	—
(c) Complete manure	9 2 6	Nitrogen	5·00	18 0	—
		Potash	4·50	5 6	—
		Water sol. phosphate.	18·00	2 0	—
		Citrate sol. phosphate	6·00	1 9	—
		Acid sol. phosphate ..	4·00	—	0 5 4

CONVERSION TABLE FOR FERTILISERS.

The ingredients of fertilisers of most importance to plant growers are nitrogen (N), potash (K_2O), and phosphoric acid (P_2O_5), and when estimating the value of any particular manure the figures showing the fertilising constituents should be converted to these substances, no matter how they may be expressed in the analysis supplied with the manure. It has, however, become customary in South Australia to express the phosphoric acid content as tri-calcic phosphate, or as so much tri-calcic phosphate converted into another form, and so only the compounds of nitrogen and potassium are converted back to the plant foods, and phosphatic fertilisers are valued on their calcium phosphate content. To help in converting the figures supplied in analyses of fertilisers back to substances generally used for valuation purposes, the following figures are useful.

TABLE XXV.—*Conversion Table for Manures.*

To Convert	Into	Multiply by
Ammonia	Nitrogen	0·824
Sulphate of ammonia	Nitrogen	0·212
Nitrate of soda	Nitrogen	0·165
Nitrogen	Ammonia	1·214
Nitrogen	Sulphate of ammonia	4·714
Nitrogen	Nitrate of soda	6·071
Ammonia	Sulphate of ammonia	3·882
Sulphate of ammonia	Ammonia	0·257
Ammonia	Nitrate of soda	5·000
Nitrate of soda	Ammonia	0·200
Phosphoric acid	Tricalcic phosphate	2·183
Tricalcic phosphate	Phosphoric acid	0·458
Sulphate of potash	Potash	0·540
Muriate of potash	Potash	0·630
Potash	Sulphate of potash	1·850
Potash	Muriate of potash	1·585
Carbonate of lime	Lime	0·560
Lime	Carbonate of lime	1·786

SUMMARY.

1. A *manure* is a substance which makes good a shortage of mineral plant food, whilst a *soil amendment* improves the mechanical condition of the soil or corrects the excessive acidity or alkalinity of the soil.

2. It is in the stream of water constantly passing through the tissues of the plant, from roots to leaves, that the mineral matters necessary to the growth of the plants are brought from the soil.

3. In a semi-arid climate the amount of water which passes through the tissues of plants, for every pound of dry matter formed, varies from 300lbs. to 500lbs. for cereals up to something about 800lbs. for potatoes.

4. The dry matter of the higher plants consists of about 95 per cent. of organic matter and about 5 per cent. of mineral matter.

5. Although the amount of mineral matter in plants is not great it is quite essential to normal growth, and not only must they get sufficient total mineral matter, but they must be able to absorb their full requirements of all the individual minerals required by them.

6. Because the only essential mineral matters of which there is likely to be a shortage in most soils are nitrogen, potash, phosphoric acid, and, in a few cases, lime, the definition of *manuring* can be simplified to "*making good a deficiency in the soil of nitrogen, potash, phosphoric acid, or lime.*"

7. Nitrogen is the plant food which encourages luxuriant, leafy growth in plants.

8. Potash has the special function of promoting the formation of the carbohydrates and fibre, *i.e.*, sugars, starch, oils, cellulose, &c., makes plants more resistant to diseases, and especially encourages the growth of leguminous plants.

9. Phosphoric acid stimulates early root development, promotes vigor in plants in the early stages of growth, leads to early maturity, and tends to the development of flowers and seeds rather than leaf and stem.

10. Australian soils are notably deficient in phosphoric acid, and so making good the shortage, by applications of phosphatic fertilisers, becomes necessary fairly soon after our soils are brought into cultivation.

11. In cold, wet countries nitrogenous manures are probably the most important, but in countries with a hot, dry climate phosphatic fertilisers are generally the only ones that have a permanent value.

12. Provided raw rock phosphate is finely ground it makes a suitable manure for some conditions, and can generally be used with advantage in sour soils, in peaty soils, where the rainfall is heavy, and where irrigation is practised.

13. Finely ground bones make a good phosphatic manure for light soils poor in lime, such as sands and gravels.

14. Basic slag is a good form in which to apply phosphoric acid to clayey soils where there is heavy rainfall or where irrigation is practised.

15. On practically all normal soils superphosphate is the most effective of the phosphatic fertilisers, but to secure full benefit from dressings the soil should contain an excess of calcium carbonate.

16. Lime is not often required as a direct *manure*, but it is a most valuable *soil amendment*.

17. In the few places where a shortage of manganese prevents the good growth of crops the trouble can be corrected by applying 14lbs. to 28lbs. of manganese sulphate per acre mixed with the ordinary dressing of superphosphate.

18. Although its direct benefit as a carrier of plant food is not so very wonderful, the indirect value of farmyard manure makes it the most important of the manures.

19. Horse manure is well suited for use in cold, wet soils, and is useful in the construction of hot beds.

20. Because of its slow decomposition the manure from cattle is valuable for sandy soils, and can be depended upon to have a lasting effect.

21. Weight for weight, sheep manure is the most valuable manure of any of the ordinary farm animals, and is exceptionally well suited for the forcing of plants.

22. Pig manure is very similar to cattle manure in its action, and so is suitable for use in light, sandy soils.

23. The droppings of domesticated birds, particularly those of pigeons and fowls, are really well supplied with fertilising elements, and are suitable for application to all plants needing forcing.

24. Farmyard manure gives striking results on most soils in the moister portions of the world, but in semi-arid climates it has rather low agricultural value, except for market gardens and fruit orchards.

25. Farmyard manure maintains the fertility of the soil better than any ordinary combinations of artificials.

26. Guano is a manure consisting mainly of the excreta of sea birds, and, when fresh, is a well-balanced manure, safe to use for all crops.

27. Where farmyard manure is scarce and it is necessary to build up the organic-matter-content of the soil, green manuring is practised.

28. Green manuring consists in ploughing into the soil a crop which grows rapidly and will decompose quickly.

29. Dried blood is a valuable organic manure, the principal fertilising constituent of which is nitrogen.

30. Besides being an important *direct fertiliser,* farmyard manure has high value as a *soil amendment* and as an *indirect fertiliser.*

31. Lime loosens heavy-textured soils and tends to make sandy soils firmer.

32. Lime neutralises acids in the soil and maintains the normal reaction so necessary for most of the cultivated crops.

33. Lime has a stimulating action on the soil and liberates other plant foods from their unavailable combinations.

34. Gypsum is an important *indirect fertiliser* and *soil amendment,* and benefits some plants, particularly the legumes, to a remarkable degree.

35. In heavy rainfall countries salt is a useful *soil amendment,* but should not be used in semi-arid climates because it increases the harmful chlorides to a dangerous degree.

36. Where very heavy and varied cropping is practised the fertility of the land can be kept up to a high pitch if the following additions are made:—20 tons farmyard manure per acre every fourth year: 5cwts. lime per acre every second year; 300lbs. per acre each planting of a mixture of two parts superphosphate (45%), one part sulphate of ammonia, and one part muriate of potash; and ½cwt. of sulphate of ammonia per acre twice during the growth of the plants.

37. The addition of nitrogenous fertilisers to cereal crops grown on fallowed land rarely gives sufficient increase in South Australia to cover the expense of the operation.

38. The manuring of cereals with nitrogen on unfallowed land may prove a business proposition in some localities in this country.

39. Potassic manures are not required for most crops grown in South Australia.

40. Most Australian soils are notoriously deficient in phosphoric acid, and almost without exception additions of phosphatic manures give very large increased yields of annual plants, and most assuredly of the cereals.

41. In those parts of South Australia where the average annual rainfall is about 14in. about ¾cwt. superphosphate (45%) should be applied per acre to cereals grown on fallowed land: where the rainfall is about 17in. the dressing should be 1cwt. per acre or more; and where the rainfall is 18in. or over from 1½cwts. to 2cwts. should be applied per acre.

42. The "blighting" of cereal crops is never directly due to applications of superphosphate, but is caused by the presence of excess of organic matter in the soil.

43. Although nearly all of the leguminous crops require lime, most of our country is so well supplied with this substance that it is only necessary to apply a phosphate as manure to obtain full yields from them.

44. In the vast majority of cases the manuring of pastures to secure the maximum economic returns consists in supplying phosphoric acid. Depending on conditions, applying from 1cwt. to 2cwts. superphosphate (45%) per acre per year is the best way to get results in this country.

45. Vines, citrus fruits, and peaches usually benefit from applications of fertilisers, but results of trials on other fruits in various countries of the world are very conflicting.

46. Unless the other requirements of plants from the soil are met, such as good mechanical condition, presence of organic matter and lime, good drainage, thorough aeration, and adequate supplies of rain or irrigation water, full success from applications of manures cannot be expected.

47. A useful liquid manure for forcing plants can be made by adding 1½ozs. superphosphate, ½oz. sulphate of potash, and 1½ozs. nitrate of soda to a kerosine tin of water, and applying it to three or four square yards of soil.

48. All fertilisers cannot be mixed indiscriminately without, in some cases, leading to losses of available plant food or affecting the mechanical condition of the mixture.

49. Fertilisers are usually valued on what is known as the unit system, and a unit of any of the fertilising substances is taken as 1 per cent. per ton.

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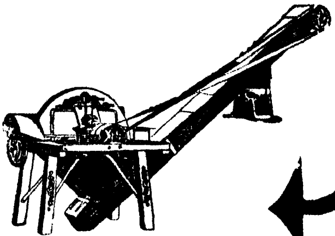

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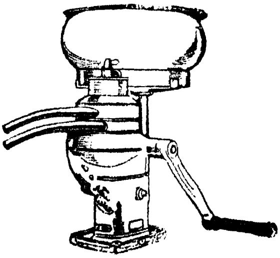

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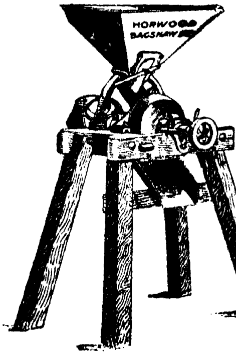

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AGRICULTURAL EXPERIMENTS IN SOUTH AUSTRALIA.

[By R. C. Scott, Supervisor of Experimental Work.]

(Continued from page 293.)

EXPERIMENTS AT YURGO.

Conducted on the Property of Mr. H. Sanders.

Agricultural experiments have been conducted at Yurgo for the past ten seasons and the district and department are indebted to Mr. Sanders for the interest he has shown and for accepting the additional work which these experiments involve.

During this period reports have been published from time to time and a particular class of experiment finalised or varied according to circumstances. At present the tests in progress comprise wheat variety, manurial, rotational and tillage experiments.

The latter have only recently been commenced and deal with the influence of cultipacking the soil on wheat crops sown on fallow land. As yet no results are available on which to report. The remainder have all been conducted for a number of seasons and have been mentioned in the records previously published.

Mr. Sanders' farm is situated about 10 miles from Karoonda and two miles North-West of Yurgo which is a siding on the Peebinga Railway line.

The land is fair class Mallee type with sandy rises and heavier loam soil on the intervening flats. However, the great bulk of it overlies good quality red colored clay subsoil.

Rainfall at Yurgo.

	1927.	1928.	1929.	1930.	1931.	Means 1922-31.
	Ins.	Ins.	Ins..	Ins.	Ins.	Ins.
January	0·70	1·08	0·36	0·00	0·54	0·46
February	0·46	1·95	0·04	0·40	0·00	0·63
March	0·37	1·44	0·11	0·03	0·92	0·44
April	0·00	0·11	0·41	0·62	1·10	0·52
May	1·31	1·38	1·08	1·14	1·58	1·95
June	1·64	2·71	1·67	0·79	3·11	1·91
July	1·08	0·78	1·39	2·22	1·48	1·38
August	0·87	0·49	0·54	2·52	1·72	1·41
September	0·91	0·13	0·82	0·84	1·25	1·47
October	1·05	2·06	0·62	3·83	0·64	1·48
November	0·19	0·07	0·50	0·36	0·52	0·47
December	0·54	0·04	3·56	0·32	0·05	0·63
Totals	9·12	12·24	11·10	13·07	12·91	12·75

Useful Rainfall.

	1927.	1928.	1929.	1930.	1931.	Means 1922-31.
Seeding Rains (April-May)	1·31	1·49	1·49	1·76	2·68	2·47
Winter Rains (June-July)	2·72	3·49	3·06	3·01	4·59	3·29
Spring Rains (August-October)	2·83	2·68	1·98	7·19	3·61	4·36
Early Summer Rains (November)	0·19	0·07	0·50	0·36	0·52	0·47
Totals	7·05	7·73	7·03	12·32	11·40	10·59

The mean total rainfall at Yurgo is 12·75 inches, whilst that for the past two seasons has been 13·07 and 12·91 inches respectively. The best years were experienced at the commencement of the experiment when for the three seasons 1922, 1923, and 1924, an average rainfall of 15·39 inches was registered.

The "Useful" fall over the full period is 10·59 inches representing slightly more than 82 per cent. of the total. This percentage indicates why satisfactory cereal crops are possible under such low total rainfall conditions-

In this connection it is interesting to note that in 1930 over 94 per cent. of the rain which fell was of direct benefit to cereal crops and only three-quarters of an inch was recorded for the remainder of the year.

During 1930 the critical period occurred in the month of September when only 84 points of rain fell, whilst in 1931 the season closed up quickly and the October rains were much below the average.

Manurial Experiments at Yurgo.

Manure.	1930.		1931.		1930-31.		Manure.	1922-27.	
	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.		Bush.	Lbs.
No manure	17	53	13	39	15	46	No manure	11	37
½cwt. 45% Super (11½lbs. P_2O_5)	25	36	13	37	19	37	½cwt. 36% Super (9lbs. P_2O_5)	21	8
1cwt. 45% Super. (23lbs. P_2O_5)	26	38	14	45	20	42	1cwt. 36% Super (18½lbs. P_2O_5)	22	59
1½cwt. 45% Super. (34½lbs. P_2O_5)	27	22	15	14	21	18	2cwt. 36% Super (37lbs. P_2O_5)	26	40
2cwts. 45% Super. (46lbs. P_2O_5)	27	18	17	6	22	12	3cwt. 36% Super (55½lbs. P_2O_5)	26	45
3cwt. 45% Super. (69lbs. P_2O_5)	27	55	19	3	23	34	—	—	

From 1922 to 1927 manurial experiments were conducted with 36 per cent. Superphosphate on land forming portion of the rotational plots which had never previously received superphosphate. When an alteration to the plan of rotational experiment was made in 1928 it was decided to terminate the manurial tests but in response to a request from the members of the local Agricultural Bureau they were re-commenced in 1930, utilising 45 grade superphosphate for the purpose. However, under this arrangement it was necessary to conduct the experiment in any convenient field which Mr. Sanders happened to be cropping and consequently the No Manure plot was seeded on land which had received a dressing of superphosphate in previous seasons. This fact is illustrated in the results obtained and in 1930-31 the improvement in yield due to the influence of the first half-hundred weight of superphosphate is not nearly so marked as was the case when the No Manure crop was unable to receive benefit from earlier phosphatic applications. In both series the highest yield was harvested from the plot receiving the maximum dressing of superphosphate but the actual results from each are not comparative since they were obtained over a different period of years. In order to analyse the position it is necessary to reduce the returns to a cash basis and for this purpose wheat has been valued at 3s. 4d. per bushel; 45 grade superphosphate at 5s., and 36 grade at 4s. 6d. per cwt.

When these valuations are made there is no appreciable difference between the net cash returns from the 1cwt.. 1½cwts., 2cwts., and 3cwts. dressings of 45 grade super., as the margin between each is only a few pence.

In the case of the 36% manure the greatest monetary return follows the 2cwts. application representing 37lbs. of phosphoric acid, or a little more than that contained in 1½cwts. of 45% superphosphate.

It would appear, therefore, that with wheat at this figure the superphosphate dressing should not be less than 1cwt. of 45 grade superphosphate, and should preferably be within the vicinity of 1½cwts. per acre.

Wheat Varieties, Yurgo.

	1928.		1929.		1930.		1931.		Means, 1928-31.	
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
Nabawa	23	31	16	11	24	46	16	15	20	11
Gluford	23	41	17	0	18	45	16	50	19	4
Caliph	20	51	20	25	16	33	17	31	18	50
Currawa	16	19	18	24	22	47	14	52	18	6
Baldmin	19	53	18	36	19	52	13	43	18	1
Begum	27	51	18	53	19	55	—		—	
Sword	—		—		21	0	18	47	—	
Merredin	—		—		26	4	17	49	—	
Collation	—		—		—		14	9	—	

In all 23 varieties have been submitted to test, but from time to time certain ones have been discarded, and those now included in the experiment are shown in the above table.

That accepted as the standard for comparison is Caliph, and for many seasons this wheat has yielded consistently well. Currawa is another variety which has been included since the commencement of the experiment, but over the full period has averaged considerably less than Caliph.

The best yielding wheats during the past four years have been Nabawa, 20bush. 11lbs., and Gluford, 19bush. 4lbs. per acre. The latter is somewhat unfixed in type, but at the same time has given very good returns, and is sufficiently valuable to justify additional work in the selection of a strain possessing uniform characteristics. The average for Baldmin is 18bush. 1lb. This variety appears to be somewhat too late in maturing for normal seasonal conditions in this district. Amongst the wheats more recently introduced Sword, Merredin, and Begum have given very satisfactory returns, although the latter is somewhat susceptible to rust, and on that account may ultimately have to be discarded.

ROTATIONAL EXPERIMENT AT YURGO.

The need for a suitable rotation under which wheat growing is associated with the carrying of livestock is generally recognised throughout the Mallee lands. However, it is also evident that in the early days of development it is necessary to get the scrub under control as quickly as possible, whilst the erection of fences and the provision of water supplies are costly items. Consequently, for the first few years at any rate no regular rotational plan is possible, but sooner or later some system must be adopted which embraces both cropping and grazing.

Previous experiments have indicated that on those areas at Yurgo where a good quality clay subsoil is within easy reach of plant roots, lucerne does really well. Therefore, in the rotational plan being tested lucerne provides the grazing crop occupying the land for four seasons before being broken up and the field fallowed in preparation for wheat. This scheme is on much the same lines as a previous experiment, which has been fully reported upon in earlier years, and only varies in details such as manuring, lucerne, seeding, &c.

The rotation occupies six seasons, and is as follows :—

First Year.—Bare fallow.
Second Year.—Wheat, 1cwt. 45 grade superphosphate per acre.
Third Year.—Lucerne, 6lbs. drilled in wheat stubble with 1cwt. super. per acre.
Fourth Year.—Lucerne, topdressed 1cwt. 45 grade super. per acre.
Fifth Year.—Lucerne, topdressed 1cwt. 45 grade super. per acre.
Sixth Year.—Lucerne, topdressed 1cwt. 45 grade super. per acre.

Each plot is six acres in area, and the whole series cover a little more than 36 acres. The lucerne is sown in the wheat stubble of the previous year, together with a light seeding of oats. No grazing figures are available, but a position has now been reached when grazing records for first, second, third, and fourth year lucerne can be secured in every season, thus completing a cycle of the experiment. These will be published in the next report.

CULTIPACKING EXPERIMENTS AT YURGO.

In order to ascertain the influence of cultipacking on crop development and control of drift a series of experiments have recently been commenced under the following plan:—

1. Not cultipacked.
2. Cultipacked shortly after ploughing.
3. Cultipacked shortly after ploughing and again after seeding.
4. Cultipacked in early summer.
5. Cultipacked in early summer and again after seeding.
6. Not cultipacked.
7. Cultipacked immediately before seeding.
8. Cultipacked shortly after seeding.
9. Cultipacked after germination.
10. Not cultipacked.

No results from this experiment are available as yet.

PRUNES.

The nutritional value of dried prunes, beyond their widely recognised laxative property, have not received much consideration until very recently. Dried prunes are a good source of vitamins A and B, but do not contain C; they are richer than apples and pears in B. Dr. Eddy states that cooked prunes contain 280 units of vitamin A per ounce and six units of vitamin B, and also 28 units of G, which places them in a higher class than apples, bacon, beef, beet, cauliflower, lettuce, milk, orange, pear, potato, and tomato, and equal to spinach, which has an equal G content. The ash contents are phosphates, lime, magnesia, soda, potash, also .005 of iron. A general analyses by Messrs. Gale and Cruess is as under:—Pits, 14.75 per cent.; moisture, 18.36 per cent.: total soluble solids, 77.97 per cent.; sugar as invert, 46.78 per cent.; sucrose, 3.37 per cent.; invert sugar, 43.93 per cent.; protein, 2.79 per cent.; total acid as citric, 1.20 per cent. The sugar content is a good source of energy, having 23 calories per ounce of fruit, the fruit as bought having 335 calories per pound. Prunes are thus desirable in the diet as a good source of vitamins A and B, for the hemoglobin regenerative property, for their mineral content and food value. Extract from *Western Canner and Packer.*

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FERTILISERS ACT, 1918—ANALYSES OF FERTILISERS.

Following are results of analyses obtained by the Government Agricultural Analyst from samples procured and supplied during the year ended December 31st, 19 2.

Note.—*Deficiencies greater than permitted under Section 12 of the Act are shown in bold type.*

Sample No.	Name of Firm and Fertiliser.	Phosphate. Water Soluble. Vendor's Guarantee.	Phosphate. Water Soluble. Result of Analysis.	Phosphate. Citrate Soluble. Vendor's Guarantee.	Phosphate. Citrate Soluble. Result of Analysis.	Phosphate. Acid Soluble. Vendor's Guarantee.	Phosphate. Acid Soluble. Result of Analysis.	Phosphate. Total. Vendor's Guarantee.	Phosphate. Total. Result of Analysis.	Nitrogen. Vendor's Guarantee.	Nitrogen. Result of Analysis.	Nitrogen as Nitrates. Vendor's Guarantee.	Nitrogen as Nitrates. Result of Analysis.
	Adelaide Chemical and Fertiliser Co., Ltd.—	%	%	%	%	%	%	%	%	%	%	%	%
1890	Bone and Super.	21·0	22·3	10·0	10·6	12·0	15·6	43·0	48·5	1·6	1·9	—	—
2247	Bone and Super.	21·0	23·4	10·0	8·6	12·0	13·8	43·0	45·8	1·6	1·8	—	—
1889	Bonedust	—	—	—	—	40·0	44·5	40·0	44·5	3·25	3·9	—	—
2176	Bonedust	—	—	—	—	40·0	39·8	40·0	39·8	3·25	3·25	—	—
2255	Bonedust	—	—	—	—	40·0	43·4	40·0	43·4	3·25	3·4	—	—
2256	"Cromptons" Special Bone Manure	—	—	—	—	35·0	37·4	35·0	37·4	5·0	5·4	—	—
—	*Muriate of Potash	—	—	—	—	—	—	—	—	—	—	—	—
2243	*Muriate of Potash	—	—	—	—	—	—	—	—	—	—	—	—
2246	P.N.P. Mixture	28·0	28·1	1·0	1·6	2·0	1·4	31·0	31·1	1·5	1·9	—	—
2245	Super. and Ammonia, No. 3	30·0	30·8	0·67	2·6	1·33	1·5	32·0	34·9	6·5	6·5	—	—
1756	Top Special Super.	45·0	47·0	—	—	—	—	45·0	47·0	—	—	—	—
1888	Top Special Super.	45·0	47·5	—	—	—	—	45·0	47·5	—	—	—	—
2179	Top Special Super.	45·0	47·3	—	—	—	—	45·0	47·3	—	—	—	—
2244	Top Special Super.	45·0	47·2	—	—	—	—	45·0	47·2	—	—	—	—
	Cresco Fertilisers, Ltd.—												
1713	45 Super.	45·0	46·1	—	—	—	—	45·0	46·1	—	—	—	—
1891	45 Super.	45·0	45·6	—	—	—	—	45·0	45·6	—	—	—	—
2177	45 Super.	45·0	47·2	—	—	—	—	45·0	47·2	—	—	—	—
2248	45 Super.	45·0	46·9	—	—	—	—	45·0	46·9	—	—	—	—
2178	Potato Manure	15·5	16·1	3·1	7·6	29·5	28·5	48·1	52·2	1·5	1·8	—	—

* Supplied by Importers.

Analyses of Fertilisers—*continued.*

Sample No.	Name of Firm and Fertiliser.	Potash in Water Soluble Form.		Calcium Oxide. CaO.		Calcium Oxide Expressed as Calcium Sulphate. CaSo4.		Bone Manure, Fine Material.		Agricultural Lime Fine Material.		Gypsum, Fine Material.		Phosphate Fertiliser, Fine Material.		Moisture.
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Result of Analysis.
	Adelaide Chemical and Fertiliser Co., Ltd.—	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
1890	Bone and Super.	—	—	—	—	—	—	—	—	—	—	—	—	60·0	61·0	4·7
2247	Bone and Super.	—	—	—	—	—	—	—	—	—	—	—	—	60·0	72·0	8·3
1889	Bonedust	—	—	—	—	—	—	50·0	52·0	—	—	—	—	—	—	6·6
2176	Bonedust	—	—	—	—	—	—	50·0	65·0	—	—	—	—	—	—	7·0
2255	Bonedust	—	—	—	—	—	—	50·0	51·0	—	—	—	—	—	—	12·7
2256	"Cromptons" Special Bone Manure	—	—	—	—	—	—	40·0	65·0	—	—	—	—	—	—	8·0
—	*Muriate of Potash	**50·0**	**47·1**	—	—	—	—	—	—	—	—	—	—	—	—	1·33
2243	*Muriate of Potash	50·0	49·6	—	—	—	—	—	—	—	—	—	—	—	—	0·9
2246	P.N.P. Mixture	7·5	8·4	—	—	—	—	—	—	—	—	—	—	—	—	5·2
2245	Super. and Ammonia. No. 3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·0
1756	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·2
1888	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6·3
2179	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·3
2244	Top Special Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·4
	Cresco Fertilisers, Ltd.—															
1713	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·8
1891	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·8
2177	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·3
2248	45 Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·7
2178	Potato Manure	7·5	7·9	—	—	—	—	—	—	—	—	—	—	—	—	3·7

* Supplied by Importers.

ANALYSES OF FERTILISERS—*continued*.

Sample No.	Name of Firm and Fertiliser.	Phosphate.								Nitrogen.		Nitrogen as Nitrates.	
		Water Soluble.		Citrate Soluble.		Acid Soluble.		Total.					
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.
	Hoffmann, H. W.—												
2145	Para Bone Manure	—	—	—	—	40·0	51·7	40·0	51·7	3·0	3·9	—	—
	Jacobs, Ltd., W.—												
1712	Bone Manure	—	—	—	—	—	—	29·0	35·5	4·0	4·4	—	—
1714	Bone Manure	—	—	—	—	—	—	29·0	29·8	4·0	5·4	—	—
1715	Bone Manure	—	—	—	—	—	—	29·0	30·8	4·0	5·1	—	—
	Metropolitan Abattoirs Board—												
2252	MAB Blood Manure	—	—	—	—	—	—	—	—	13·0	13·8	—	—
2253	MAB No. 1 Bone Manure	—	—	—	—	25·0	29·6	25·0	29·6	7·5	7·5	—	—
2254	MAB No. 2 Bone Manure	—	—	—	—	25·0	32·5	25·0	32·5	4·5	5·7	—	—
	Shell Fertilisers, Ltd.—												
2144	Ground Oyster Shell	—	—	—	—	—	—	—	—	—	—	—	—
2257	Ground Oyster Shell	—	—	—	—	—	—	—	—	—	—	—	—
	S.A. Gas Co.—												
2146	I.C.I. Sulphate of Ammonia	—	—	—	—	—	—	—	—	20·0	21·0	—	—
	Wallaroo-Mt. Lyell Fertilisers, Ltd.—												
2250	Bonedust	—	—	—	—	40·0	42·8	40·0	42·8	3·25	3·6	—	—
2251	Guano Super.	27·0	27·1	3·0	2·5	3·0	5·2	33·0	34·8	—	—	—	—
1887	W.M.L. Extra High Grade Super.	45·0	46·3	—	—	—	—	45·0	46·3	—	—	—	—
2249	W.M.L. Extra High Grade Super.	45·0	47·0	—	—	—	—	45·0	47·0	—	—	—	—

ANALYSES OF FERTILISERS—*continued.*

Sample No.	Name of Firm and Fertiliser.	Potash in Water Soluble Form.		Calcium Oxide. CaO.		Calcium Oxide Expressed as Calcium Sulphate. CaSo4.		Bone Manure. Fine Material.		Agricultural Lime. Fine Material.		Gypsum. Fine Material.		Phosphate Fertiliser. Fine Material.		Moisture.
		Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Vendor's Guarantee.	Result of Analysis.	Result of Analysis.
	Hoffmann, H. W.—															
2145	Para Bone Manure	—	—	—	—	—	—	45·0	62·3	—	—	—	—	—	—	7·3
	Jacobs, Ltd., W.—															
1712	Bone Manure	—	—	—	—	—	—	75·0	78·2	—	—	—	—	—	—	4·0
1714	Bone Manure	—	—	—	—	—	—	75·0	71·0	—	—	—	—	—	—	2·6
1715	Bone Manure	—	—	—	—	—	—	75·0	73·0	—	—	—	—	—	—	2·1
	Metropolitan Abattoirs Board—															
2252	MAB Blood Manure	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·5
2253	MAB No. 1 Bone Manure	—	—	—	—	—	—	50·0	52·5	—	—	—	—	—	—	5·1
2254	MAB No. 2 Bone Manure	—	—	—	—	—	—	**67·0**	**57·5**	—	—	—	—	—	—	10·1
	Shell Fertilisers, Ltd.—															
2144	Ground Oyster Shell	—	—	30·0	34·3	—	—	—	—	80·0	82·7	—	—	—	—	—
2257	Ground Oyster Shell	—	—	30·0	30·1	—	—	—	—	80·0	81·0	—	—	—	—	2·4
	S.A. Gas Co.—															
2146	I.C.I. Sulphate of Ammonia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Wallaroo-Mt. Lyell Fertilisers, Ltd.—															
2250	Bonedust	—	—	—	—	—	—	50·0	60·5	—	—	—	—	—	—	7·5
2251	Guano Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4·8
1887	W.M.L. Extra High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8·4
2249	W.M.L. Extra High Grade Super.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9·2

FOOT ROT IN SHEEP.

[*Reply given by Mr. Alan H. Robin, B.V.Sc. (Stock and Brands Department), to a question submitted at the Lower North Conference of the Agricultural Bureau on the prevention and cure of Foot Rot in sheep.*]

Foot rot in sheep is caused by a germ known as the *Bacillus necrophorus*, gaining an entry into the tissues of the foot through some injury or abrasion to the skin between the claws or in the vicinity of the coronet, or through cracks in the horn.

Anything which will occasion injury or break in the skin or horn of the foot will predispose to the disease. The most important and common predisposing factor leading to its establishment in a flock, is the grazing of the sheep on wet, boggy pastures, as under these conditions, the horn of the foot becomes softened by the continual wetting, and is more easily injured. Further, mud accumulates between the toes, and when it becomes hard, causes injury to the horn and skin there, thus opening up the way for germ infection of the tissues to take place.

The prevention of the disease is very largely a matter of preventing the operation of the predisposing factors that lead up to it. Therefore, during the wet season, overstocking of pastures should be avoided and the sheep as far as possible kept on high ground or else well drained pastures. Their feet should be regularly trimmed as may be necessary and all overgrown and broken horn, &c., removed.

As a further precaution, to counteract the damaging effects of continual wetting on the horn of the foot, if owing to the nature of one's paddocks this cannot well be minimised, the flock can periodically, during the wet season, be mustered and run through a foot-bath, containing a solution of either—(1) bluestone, 6ozs. per gallon of water; or (2) formalin, 1 part to 9 of water.

These solutions have a drying and hardening effect on the feet which helps to maintain them in sound order.

It must further not be overlooked that the disease may be brought on to a property through the medium of new sheep purchased from outside sources. Therefore, before any such sheep are added to the flock, they should be first thoroughly examined for any evidence of their having the disease in them. Even if they appear to be free from the trouble, it would be wise to isolate them for a time if possible to make sure.

With respect to the control of Foot rot, it should be realised that the disease is highly contagious, and unless prompt measures are taken will rapidly spread through a flock once it gets a footing in it. Furthermore, the earlier affected animals are treated, the easier it is to cure them. Therefore if the disease should make its appearance, the whole flock should be mustered and all animals closely examined so that affected ones can be separated from the healthy ones. These latter should then be run through the foot-bath (after first cleaning and trimming up the feet), and then be put into a different paddock from the one in which the disease occurred. Periodical inspections of them should be made to detect the development of any further cases among them.

Affected sheep should be divided into two groups, those lightly affected and which will probably recover after two or three treatments, and those which are badly affected and which will require individual treatment over an extended period.

Whatever form of treatment is given, it must be understood that *the fundamental and essential principle for success is a thorough preliminary trimming of the hoof, so as to effectively expose all diseased areas to the action of the antiseptic dressing employed.*

On small flocks where only a few animals are affected, each animal is best treated individually. First of all, the feet must be thoroughly cleansed from all mud, &c., and all diseased, loose, and under-run horn then carefully cut away. Any abscesses present should be opened up and drained and any proud flesh cut away. All this preliminary treatment must be rigidly and thoroughly carried out, and all diseased hoof parings, etc., effectively disposed of, preferably by burning.

After the feet have been cleaned up in this way, an antiseptic dressing is then applied. A preparation recommended by the Livestock Division of the Victorian Department of Agriculture as being most effective is a paste prepared as follows:—

Stir into 1qt. of warm Stockholm tar 2ozs. of finely powdered bluestone and 1 tablespoonful of lysol or monsol.

This dressing is applied to the trimmed and prepared foot with a brush.

If a more liquid dressing is preferred, then they recommend either of the following to be used:—

(1) 6ozs. bluestone dissolved in 1gall. water; or
(2) 1 part of formalin to 9 parts water.

Using either of these dressings, it is necessary to hold the sheep so that its feet will remain immersed in the solution for a few minutes. (In preparing the bluestone solution, wooden or earthenware vessels must be used).

The treatment of the feet should be repeated daily if possible until a cure is effected. After each dressing, the sheep should be placed in a dry, clean spot until the feet are dry.

With larger flocks, where a considerable number of animals have to be treated, the use of a foot-bath becomes necessary to treat them expeditiously, though the severest cases are still best treated individually, as already outlined.

In using the foot-bath, after the feet have been trimmed and cleaned up, the sheep should be passed slowly through the bath so that they take at least three or four minutes to go through the solution. Care must be taken that they do not rush through too quickly, or go through on three legs, and after passing through the bath, they should be held in a dry, clean yard until their feet are thoroughly dry, so that they will not carry any solution away to contaminate the feed.

They should then be placed in a clean pasture, and on no account returned to the paddock where the disease occurred.

Another treatment that the same Department states has given excellent results is to run the sheep through a foot-bath containing a 10 per cent. solution of formalin, and then after allowing the feet to drain, making the animals stand on air slaked lime until the hoofs are dry.

That form of the disease which is characterised by abscess formation in the fetlock region is best treated by opening the abscesses to drain thoroughly and then syringing out the wound with 2½ per cent. monsol or lysol.

A final precaution necessary in controlling this disease is that a paddock in which an outbreak of the disease has occurred should be kept free of stock and placed under cultivation; failing this, it should be burnt over at the earliest opportunity.

YOUR CAREER

Unless you have been specially fortune favoured, the success of your career, so vital to your whole life, is going to depend primarily upon your own efforts. There may be factors over which you can have no control, therefore it is the more necessary that you seriously grapple with those you can yourself govern. Naturally, money must enter into your plans for to-morrow, but action must be taken to-day if you are to succeed.

Don't wait upon so-called "luck." The Savings Account costs nothing, pays interest upon your savings, and provides the best possible aid to self help.

Commonwealth Savings Bank of Australia

GUARANTEED BY THE COMMONWEALTH GOVERNMENT.

DEPARTMENT OF AGRICULTURE.

Bulls that are purchased under regulations of the Dairy Cattle Improvement Act, and upon which Government pays a subsidy, are available, for two years after purchase, to serve a certain number of outside cows.

The following list, compiled by the Department of Agriculture, shows the names of such bulls and of the people who own them, and indicates also the months until which the respective owners will be prepared to make the services available.

As will be noticed, the distribution of subsidised bulls is now fairly general throughout the State; hence, many of those persons, who in the past have found it difficult to get the use of a good bull, should not have much similar trouble in the future. And here let it be stated that everyone of these subsidised animals is a registered purebred and from a dam of proved productivity under Government official test.

The maximum service fee is 10s. per cow.

For the information of cowkeepers, it is pointed out that, although the addresses as given in the following list are those to which application should be made for the services of the bulls, the bulls themselves may, in a few instances, be located elsewhere.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
606	Jersey	Para Vale Prince	H. S. Wiese	10, Albert St., Clarence Park	June, 1933
644	"	Oakhill Prince	G. Bain	14, Arnold St., Parkside	June, 1933
650	Friesian	Murray Glen Echo Ashlyn.	H. B. Gogler	52, Charles St., Norwood	June, 1933
667	Jersey	Pella Orlando	O. B. Schmerl	Glynde Rd., Magill	Sept., 1933
688	"	Fernden Skipper	A. R. Johnson	Sturt	Dec., 1933
691	"	Eudunda Rambler	A. G. Fox	Hectorville	Sept., 1933
697	"	Pella Sweet Duke	A. Schulze	Paradise	Sept., 1933
707	"	Kangaroo Flat Jellicoe	R. H. Jones	83, Mary St., Unley	Sept., 1933
708	"	Kangaroo Merry Mike	S. McLellan	Edwardstown	Sept., 1933
710	Friesian	Anama Netherland Pontiac	R. E. O. Osborne	Pirie Street, Adelaide	Sept., 1933
712	"	Anama Maggie's Hero	Glen Legoe & Co.	Waymouth St., Adelaide	Sept., 1933
714	"	Barina Konigen Posch	J. Marrett	Albert Park	Sept., 1933
718	"	Murray Glen Netherland Reuben	D. H. Fewings	Lockleys	Sept., 1933
721	"	Glenowie Hengerval Posch	H. Metcalfe	Enfield	Sept., 1933
731	A.I.S.	Gay Boy of Kiama	H. J. Todd	Findon	Sept., 1933
741	"	Handsome Miller of Illawarra	H. P. McLachlan	Glenelg	Oct., 1933
776	Jersey	Para Wirra Millie's Pylon	R. J. Finlayson	St. Georges	Jan., 1934
779	Friesian	Glenowie King Sylvia	R. C. McHugh	Burnside	July, 1934
812	"	Murray Glen Netherland Griselda	D. Smith	Hectorville	June, 1934
820	Jersey	Morella Sweet Duke	S. C. Bradley	Richmond Park	June, 1934
845	A.I.S.	Kiama Joffre	J. M. Irwin	Hampstead	June, 1934
899	Friesian	Murray Glen Netherland King	A. E. Press	North Adelaide	Sept., 1934
900	"	Glen Murray Pietje Pontiac	Boys' Reformatory	Magill	Oct., 1934
910	Jersey	Para Vale Milklad 2nd	F. P. Smith	Blackwood	Sept., 1934
922	"	Eudunda Damsel's Lord	D. Fitzgerald	Edwardstown	Sept., 1934
927	"	Brinkworth Myra's Repulse	R. and J. R. Goldsack	Glen Osmond	Sept., 1934
586	"	Hampden Jessie's King	H. H. Martens	Port Pirie	May, 1933
611	"	Scrub View Millie's Chief	C. F. Beck	Saddleworth	May, 1933
612	"	Para Wirra Prince	H. Shepley	Two Wells	May, 1933
624	Friesian	Anama Alcartra Botha	A. C. Ford	Kooringa	May, 1933
626	"	Anama Beauty Netherland	C. H. Noll	Wilmington	Aug., 1933
658	Jersey	Eudunda Damsel's Rambler	J. Hickey	Manoora	Aug., 1933
660	"	Hampden Guitar's Chief	B. J. Eckermann	Freeling	Aug., 1933
684	"	Delma Butter King	Mrs. M. I. Neumann	Hampden	Sept., 1933
685	"	Delma Silver Lad	E. L. Shannon	Bagot's Well	Sept., 1933
687	"	Crofton Viscount	J. T. Oates	Kangaroo Flat	Oct., 1933
698	"	Pella Noble Grey	A. E. Lines	Gladstone	Sept., 1933
700	"	Roseworthy Dean	A. W. Griffiths	Salisbury	Sept., 1933
703	"	Burnloa Smith	L. D. Jenkin	Korunye	Sept., 1933
715	Friesian	Barina Highland Segis	P. J. Brady	Barabba	Sept., 1933
717	"	Glen Murray Olda's Crusader	A. G. Johns	Port Pirie	Sept., 1933

PURE-BRED BULLS—continued.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
723	A.I.S.	Sunnybrook Boronias Victor	H. F. C. Behn	Steelton	Sept., 1933
724	"	The Bluff Waratah's Searchlight	W. L. Shannon	Kapunda	Sept., 1933
725	"	The Bluff Waratah's Limelight	A. H. Buchanan	Koolunga	Sept., 1933
734	Ayrshire	Gowrie Park Scottish Envoy	J. H. Fischer & Sons	Wasleys	Sept., 1933
735	Jersey	Fernden Noble Combination	W. A. Cook	Salisbury	Sept., 1933
737	"	Sweet Haven Mercedes Twylish	T. Roberts	Blyth	Sept., 1933
748	Friesian	Anama Netherland Knight	J. J. Burrows	Riverton	Dec., 1933
750	A.I.S.	Fortune of Dunleith	F. J. Nation	Brentwood	Nov., 1933
753	Jersey	Roseworthy Wiseman	T. Henderson	Hallett	Nov., 1933
758	"	Sweet Haven Prince	V. C. Williams	Salisbury	Oct., 1933
762	"	Hampden Queen's King	G. C. Cartwright	Nuriootpa	Jan., 1934
764	"	Pella Combination	J. S. Holmes	Williamstown	Jan., 1934
767	"	Delma Flora's Lad	F. C. Lindner	Eudunda	Feb. 1934
768	"	Pella Nobleman	C. E. Keller	Wirrabara	Jan., 1934
780	"	Para Wirra Jim	I. C. Worthley	Kangaroo Flat	Jan., 1934
783	"	Para Wirra Bob	E. H. W. Behn	Steelton	Feb., 1934
785	"	Para Wirra Jack	G. Rogers	Kooringa	May, 1934
788	"	Scrubview Lord Twylish	R. W. King	Georgetown	Feb., 1934
789	"	Scrubview Royal	F. V. Dolling	Mundoora	Mar., 1934
790	"	Scrubview Duke	M. H. Modystack	Wilmington	Aug., 1934
798	"	Hampden Mariposa's Noble	H. L. Foote	Mount Bryan	June, 1934
799	"	Hampden Blonde's Quality	A. J. Babbage	Brentwood	June, 1934
800	"	Hampden Olive's Aristocrat	H. Masters	Balaklava	May, 1934
801	"	Hampden Peerless King	W. F. Wurst	Laura	May. 1934
806	"	Eudunda Damsel's Lad	A. H. Marschall	Eudunda	Aug., 1934
817	"	Roseworthy Chancellor	Hicks Bros.	Clare	Aug., 1934
826	Ayrshire	Kyby. Rod	C. Whiting	Snowtown	May, 1934
827	Jersey	Para Wirra Percy	A. J. Marrett	Saddleworth	May, 1934
834	"	Para Vale Prince II.	L. W. Frost	Saddleworth	June. 1934
850	A.I.S.	Sunnybrook Flirt's Victor.	H. E. Krieg	Willaston	Aug., 1934
852	"	Melvin Noble	W. P. Eckermann	Eudunda	June, 1934
853	Friesian	Anama Netherland Jahn	M. C. Bentley	Koolunga	June, 1934
856	A.I.S.	Kiama Royal	J. P. Smith & Son	Tarcowie	Sept., 1934
865	Jersey	Brinkworth Repose	C. A. Ottens	Brinkworth	July, 1934
866	Friesian	Barina Matador Rocket	F. W. Kotz	Emu Downs	July, 1934
869	Jersey	Para Glen Flashlight	C. E. Mellors	Gawler	July, 1934
874	"	Para Wirra Prince 2nd	A. H. Young	Owen	Aug., 1934
882	A.I.S.	Dunleith Lieutenant	E. A. Kelly & Son	Smithfield	Sept., 1934
883	"	Strathearn Haylo 2nd.	L. J. Carman	Undalya	Sept., 1934
884	"	Strathearn Bloom's Searchlight	R. J. James	Riverton	Sept., 1934
885	"	Rivoli Hero	A. H. Frost	Lewiston	Sept., 1934
886	"	Liberton Sutala	J. McCormick	Yongala	Sept., 1934
893	Friesian	Glenowie Netherland Butterboy	L. B. Dean	Morgan	Sept., 1934
894	"	Anama Netherland Joker	E. J. H. Hoepner	Brinkworth	Sept., 1934
897	"	Anama Pontiac Mars	B. H. Hampel	Kybunga	Sept., 1934
905	Jersey	Pembroke Mischief	F. H. S. Hunt	Sandy Creek	Sept., 1934
917	"	Burnlea Echo	D. A. Agnew	Stansbury	Sept., 1934
918	"	Sweet Haven Mercedes Lord	W. G. Johncock	Narridy	Sept., 1934
920	"	Eudunda Glory's Star	M. S. Ferme	Wandearah West	Sept., 1934
923	"	Wooroora Cream Chief	H. B. Scholz	Nuriootpa	Sept., 1934
924	"	Woorooro Trumpeter	J. S. Miller	Auburn	Sept., 1934
930	"	Fernden Bullseye Combination	T. W. Roennfeldt	Greenock	Sept., 1934
931	"	Cudlee Creek Masterpiece.	T. W. Roennfeldt	Greenock	Sept., 1934
933	"	Tuela Senator	R. A. A. Thiele	Julia	Aug., 1934
934	Ayrshire	Angle Farm Richard	A. H. Hewlett	Reeves Plains	Sept., 1934
935	Jersey	Banyule Pylon	W. M. Fletcher	Lewiston	Sept., 1934
946	Friesian	Balaklava Griselda Beets	P. T. Bowker	Laura	Oct., 1934
949	Jersey	Eudunda Flavia's Chief	J. J. O'Sullivan	Tarlee	Oct., 1934
950	A.I.S.	Strathearn Bloom's Cupid.	L. F. Rowe	Cradock	Oct., 1934
951	"	Northfield Blossom's Limelight	M. E. Saint	Saddleworth	Oct., 1934
952	Ayrshire	Angle Farm Maxwell	D. Sellick	Templers	Oct., 1934
953	"	Angle Farm Martin	J. P. Orchard	Salisbury	Oct., 1934
955	Jersey	Hampden Carissa's Lad	J. F. Provis	Balaklava	Oct., 1934
959	"	Pella Silver Lining	H. P. Semmler	Lyndoch	Dec., 1934
960	"	Pella Graceful Lad	H. Mader	Eudunda	Dec., 1934
975	A.I.S.	Kiama Wizard	T. E. Richardson	Hill Town	Jan., 1935
994	Jersey	Para Wirra Don	E. W. L. Dawkins	Willaston	Feb., 1935
672	Jersey	Morella Sweet Duke 2nd	A. S. G. Barrett	Shoal Bay	Aug., 1933
965	"	Delma Mercedes Duke	A. M. Lodge	Ardrossan	Nov., 1934
996	A.I.S.	Kiama Felix	R. K. Bertram	Coobowie	Feb., 1935
1004	Jersey	Morella Belle's Chief II.	F. J. Young	Alford	Feb., 1935

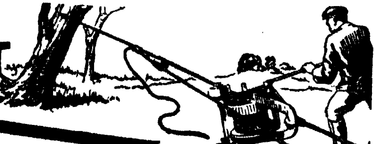
PURE-BRED BULLS—continued.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
618	Jersey	Para Wirra Dolcie's Pylon	J. J. Deer	Cleve	Aug., 1933
629	"	Crofton Highbrow	W. T. Cooper	Arno Bay	June, 1933
654	"	Hampden Flora's Lad	M. J. Edwards	Streaky Bay	July, 1933
740	"	Melvin Noble 2nd	E. G. Hunt	Darke's Peak	Sept., 1933
742	A.I.S.	Karawarra of Illawarra	A. E. and W. T. Story	Elbow Hill	Sept., 1933
754	Jersey	Morella Bill	H. L. Bruce	Kimba	July, 1934
781	"	Glen Valley Watchman	C. F. Jericho	Butler	July, 1934
786	Jersey	Para Wirra Iris's Pylon	H. F. Chilman	Warramboo	April, 1934
848	"	Lanacoona Silver Noble	I. R. Preiss	Cleve	Aug., 1934
849	A.I.S.	Sunnybrook Boronia's James	F. W. A. Du Bois	Wudinna	July, 1934
854	"	Kiama Starlight	W. C. & F. L. Jettner	Yandiah	June, 1934
908	Jersey	Glandore Neat Boy	G. M. McKechnie	Tumby Bay	Sept., 1934
916	"	Burnlea Dandy	A. R. Butler	Ungarra	Sept., 1934
964	"	Hampden Blonde's Count	W. Doudle	Coulta	Jan., 1935
966	"	Delma Gipsy's King	E. R. Elson	Cleve	Nov., 1934
602	"	Wooroora Pearl's Cavalier	W. J. L. Thacker	Narrung	April, 1933
608	"	Para Wirra Austin	R. E. Hunt	Bordertown	May, 1933
609	"	Roseworthy Major	G. C. Walken	Mount Barker	May, 1933
610	"	Crofton King Sol	W. F. Medlen	Balhannah	May, 1933
656	A.I.S.	Roger of River View	H. W. Morphett & Co.	Wood's Point	June, 1933
666	Jersey	Pella Majestic Duke	C. Burchett	Meadows	Dec., 1933
668	"	Ontario Millie's Twylish 2nd	W. Rayner	McLaren Vale	July, 1933
669	"	Lord Fancy Starbright of Bruceville	W. F. Nickels	Forreston	July, 1933
670	"	Lallawa Chieftain 2nd	E. H. Gambling	Meningie	July, 1933
671	"	Ontario's Ka's Twylish	W. B. Hay	Victor Harbor	Aug., 1933
673	Ayrshire	Scotswood Fulton 2nd	A. F. Hunt	Pinnaroo	July, 1933
686	Jersey	Delma Admiral	Mrs. B. S. Mills	Wanbi	Sept., 1933
689	"	Oakhill King	R. J. Myren	Ashville	Sept., 1933
690	"	Alinda Mercedes Duke	Mrs. M. T. Halliday	Aldgate	Sept., 1933
693	"	Eudunda Silver Star	D. V. Chapman	Houghton	Sept., 1933
694	"	Para Wirra Maglona's Pylon	Mrs. H. Meers	Kalyan	Sept., 1933
695	"	Sweet Haven Mercedes Duke	G. C. Nicol	Echunga	Sept., 1933
696	"	Brinkworth Judith's Volunteer	E. M. Edwards	Paruna	Sept., 1933
704	"	Burnlea Kingsford	A. L. E. Hoad	Sherlock	Sept., 1933
705	"	Wooroora Bonnie King	J. B. Randell	Gumeracha	Sept., 1933
709	Friesian	Anama Piebe Joe	R. B. Coleman	Balhannah	Sept., 1933
713	"	Barina Matador David	J. H. Thiele	Ambleside	Sept., 1933
716	"	Glen Murray Konigen Butterman	V. T. Bartlett	Murray Bridge	Sept., 1933
719	"	Murray Glen Netherland Butterboy	F. W. Dohnt	Gumeracha	Sept., 1933
727	A.I.S.	Northfield Limelight	Fischer Bros.	Victor Harbor	Sept., 1933
728	"	Strathearn Haylis Haylo	P. J. A. Braendler	Ambleside	Sept., 1933
729	"	Belmont of Kiama	E. H. Coote	Middleton	Sept., 1933
757	"	The Bluff Ensign	R. M. Bell	Murray Bridge	Feb., 1934
760	Jersey	Channel View Makarini's Lad	Mrs. F. V. Wildman	Yurgo	Feb., 1934
761	"	Channel View McEwin's Boy	P. Doceff	Wellington	Feb., 1934
763	"	Balaklava Rhodesian's Repulse	G. V. Rogers	Victor Harbor	Dec., 1933
766	"	Hampden Carnation's Aristocrat	H. A. Woolley	Mount Barker Junc.	May, 1934
769	"	Pella Sly Fox	H. N. Nuske	Tweedvale	Mar., 1934
770	"	Pella Masterpiece	A. L. Betteridge	Mylor	June, 1934
778	Friesian	Glenowie Netherland Triumph	A. McAlister	Jervois	May, 1934
794	Jersey	Crofton Southern Star	H. B. Kramm	Ambleside	April, 1934
795	"	Crofton Silver King	J. H. Wilhelm	Mannum	May, 1934
797	"	Alexandra's Repeater's Volunteer	J. H. Beare	Milang	May, 1934
822	"	Morella Damsel's Chief 3rd	T. M. Smee	Charleston	Sept., 1934
828	"	Burnlea Alick	S. J. Cox	Strathalbyn	Aug., 1934
835	"	Lanacoona Mercedes Duke	A. B. Rowley	Meadows	June, 1934
836	"	Lallawa Master II.	Mrs. G. G. Bowman	Tailem Bend	June, 1934
846	"	Lanacoona Noble Kelly	W. F. Roads	Inman Valley	June, 1934
847	"	Lanacoona Nimble	Mrs. M. H. Bowman	Dashwood's Gully	June, 1934
861	Friesian	Anama Netherland Paul	K. Lawson	Padthaway	Aug., 1934
876	Ayrshire	Holly Green Queen's Jamie	T. S. Paternoster	Nairne	Aug., 1934
880	Jersey	Lallawa Chieftain 3rd	J. G. Krueger	Sedan	Aug., 1934
881	A.I.S.	The Bluff Waratah's Limelight 2nd	F. H. Rowe	Peake	Sept., 1934
887	A.I.S	Sunnybrook Primrose's Pride	H. J. Jagger	Inman Valley	Sept., 1934
888	"	Kiama Pilot	J. B. Kerber	Woodside	Sept., 1934
891	Friesian	Glenowie Netherland Duke	R. G. Magor	Mypolonga	Sept., 1934
898	"	Anama Netherland Dutchman	S. D. Stoddart	Mundalla	Sept., 1934

PURE-BRED BULLS—continued.

Departmental Ref. No.	Breed.	Bull.	Owner.	Address.	Date when Subsidy Conditions Cease.
904	Jersey	Hamley Alpha Prince.....	A. B. Herrmann	Mount Torrens........	Sept., 1934
911	"	Para Vale Pilot	G. W. Woolley.........	Mt. Barker Junction...	Sept., 1934
912	"	Delma Ballarion	W. H. Roper	Strathalbyn	Sept., 1934
913	"	Oakhill Lord Lotus 3rd ...	A. B. Hartmann	Palmer	Sept., 1934
914	"	Kangaroo Flat Prince	B. McGlinchey	Millbrook	Sept., 1934
919	"	Bernoota Viola's Duke ...	R. S. Davie	Mount Pleasant	Sept., 1934
921	"	Eudunda Roderick	A. A. Sickerdick	Tweedvale	Sept., 1934
925	"	Morella Digger	A. Anderson	Meningie	Sept., 1934
937	Ayrshire	Denbigh Advance	J. M. Robinson	Meadows	Oct., 1934
938	Friesian	Murray Glen Sylvia Griselda	R. Gugielmin	Jervois	Oct., 1934
954	"	Glen Murray King Pontiac	R. Williams	Cooke's Plains	Oct., 1934
968	"	Willowvale Model Posch ..	C. Rowley............	Myponga............	Jan., 1934
972	Jersey	Ontario Marcus	T. H. Rayson.........	Native Valley	Nov., 1934
973	Ayrshire	Talmont Jamie	F. M. Green	North Gumeracha	Nov., 1934
980	Jersey	Alinda Noble Combination	W. A. Mueller	Ambleside...........	Jan., 1935
1001	"	Wooroora Rosalind's Orlando	K. M. Bowen	Flaxley	Feb., 1935
633	"	Kyby. Warrior	E. C. H. Schinckel	Kybybolite	May, 1933
643	A.I.S.	The Bluff Planet	A. L. Brown	Mount Gambier	June, 1933
736	"	Flower's Royal of River Glen	T. F. Gratwick	Kongorong	Sept., 1933
739	"	Glen Lossie's Sultan	F. D. Gower	Tantanoola	Oct., 1933
744	"	Sovereign of Kiama	A. H. Allen	Mount Gambier	Dec., 1933
745	Jersey	Morella Anemone's Chief V.	A. Robertson	Struan	Nov., 1933
747	Friesian	Anama Black Prince	G. Northen	Glencoe East	Dec., 1933
752	A.I.S.	Alex. of Kiama	R. P. Wallace	O. B. Flat	Dec., 1933
755	Ayrshire	Kyby. Wallace	A. Slater	Naracoorte	Dec., 1933
756	"	Kyby. Bonnie Dandy	Mrs. A. Watson	Millicent	Dec., 1933
765	Jersey	Hampden Juanita's Aristocrat	F. L. Rees	Glencoe East	April, 1934
782	"	Para Wirra Austin 2nd ..	Mrs. O. C. Martin	Reedy Creek	April, 1934
863	A.I.S.	Illawarra Bonnie	A. C. Bigham	Mount Gambier	July, 1934
872	Jersey	Para Wirra Pansy's Pylon.	J. M. Wray	Hynam	July, 1934
877	"	Gambier Major Twinkler .	W. F. Koop	Glencoe East.........	Aug., 1934
878	"	Gambier Rose Chief	C. R. Davis	O.B. Flat	Aug., 1934
879	"	Selsey Royal	C. R. Kerr	Compton	Aug., 1934
895	Friesian	Anama Alcartra Rex	J. S. McElroy	Lochaber	Sept., 1934
896	"	Anama Netherland King 4th	H. L. Miles	Hynam	Sept., 1934
903	Ayrshire	Kyby. Brat	E. W. Tollner	Mount Gambier	Sept., 1934
906	Jersey	Pembroke Majestic	F. W. Staude	Naracoorte	Sept., 1935
947	Ayrshire	Kyby. Ivan	H. J. S. Clark	Moorak	Sept., 1934
948	"	Kyby. Bonnie Prince	M. Glynn	Kybybolite	Oct., 1934
974	Jersey	Gambier Star Bene	C. Hitchcock	Moorak	Dec., 1934
995	Red Poll	Victoria Captain	J. L. Hoggarth	Kalangadoo	Feb., 1935

TEARING THEM OUT



is the regular job of the Monkey Grubber: in fact it was born to the work.

TREES and STUMPS, it matters not, they are torn out with roots intact, a thorough job quickly done. Run to the job like a barn truck, and worked in the same manner as a boat is rowed. It develops the power of 200 men, progressively applied, and always under perfect control.

In any position, so long as the operator has space for a footing, the machine is efficiently worked. An Automatic Gear allows a load to be hauled or released at will. Besides the great power and portability there are embodied other labour saving features, such as special rope couplings, rope shortener, snatch block, etc.

Agriculturalists in Australia, New Zealand, Great Britain, South Africa, the Americas, as well as Planters in India, China, Central Africa, Fiji, the East and West Indies, recognised its merits and applied its help.

THE "MONKEY" GRUBBER

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THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JANUARY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during January.	Per Cow during January.	Per Cow July to January.	Per Herd during January.	Per Cow during January.	Per Cow July to January.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E .	26·39	24·45	17,946½	680·05	4,414·67	710·14	26·91	180·68	3·96
7/H .	8·71	5·71	3,799½	436·22	4,273·52	184·90	21·23	216·18	4·87
7/K .	21·06	20·10	14,884½	706·76	5,731·45	651·29	30·93	237·38	4·38
7/L .	36·39	34·23	20,949½	575·79	4,465·52	929·49	25·56	211·96	4·44
7/T .	14	13·58	5,670	405·00	3,879·37	263·01	18·79	175·13	4·64
7/W .	19	15·26	9,704	510·74	4,917·61	407·06	21·42	206·59	4·19
7/Y .	25·10	20·97	12,781	509·20	4,412·94	598·81	23·86	207·15	4·69
7/Aa	14	14	7,161	511·50	3,886·32	317·99	22·71	189·13	4·44
7/Hh	17·32	17·13	10,073½	581·61	3,995·04	432·15	24·95	172·68	4·29
7Kk .	18	15·74	11,226	623·67	4,806·59	460·26	25·57	200·55	4·10
7/Mm	37	32·23	17,590	475·41	5,584·79	714·09	19·30	217·00	4·06
7/Nn .	24·26	18·42	10,853	447·36	5,138·70	451·97	18·63	200·72	4·16
7/Oo	16	13·74	8,362	522·62	4,874·71	398·06	24·88	229·48	4·76
7/Pp	20	18	10,927½	546·38	4,861·19	559·90	28·00	264·12	5·12
7/Qq	14·65	11·71	6,534½	446·04	3,647·31	347·21	23·70	204·83	5·31
7/Tt	18·06	14·16	8,736½	483·74	4,604·97	373·50	20·68	207·70	4·27
7/Uu .	22	20	9,672	439·63	4,232·27	432·96	19·68	194·28	4·48
7 Vv	13·42	11·42	7,366½	548·91	5,240·73	326·37	24·32	257·14	4·43
7/Xx	21·48	18·94	13,851	644·83	5,508·99	744·57	34·66	302·42	5·38
7/Yy.	20	17·84	9,125	456·25	3,763·71	440·23	22·01	167·95	4·82
7/Aaa	7·10	6·10	2,166½	305·14	2.504·97	98·90	13·93	113·86	4·56
Means	19·71	17·32	10,446·67	529·98	4,588·06	468·71	23·78	207·98	4·49

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JANUARY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during January.	Per Cow during January.	Per Cow October to January.	Per Herd during January.	Per Cow during January.	Per Cow October to January.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	33	26·61	16,518	500·54	2,615·10	835·11	25·31	133·68	5·06
5/D	32	25·13	15,366½	480·20	2,544·90	779·47	24·36	138·41	5·07
5/E .	43	38·23	17,475	406·43	2,327·08	916·44	21·31	126·10	5·26
5/P .	32	28·71	16,538½	516·83	2,544·28	815·69	25·49	125·05	4·93
5/R .	69	61·97	21,697	314·45	1,806·76	933·53	13·53	75·06	4·30
5/S ..	20·35	11·87	4,419	217·15	1,858·90	222·84	10·95	90·71	5·04
5/Y .	26·58	24·84	14,032½	527·93	2,371·03	695·99	26·18	122·08	4·96
5/Z ..	41	31·16	20,900	509·76	2,668·61	980·97	23·93	128·13	4·69
7/Ee	18	18	12,911½	717·31	3,386·81	642·38	35·69	164·65	4·98
5/Gg	23	20·23	8,779	381·69	1.696·14	422·41	18·37	80·68	4·81
5/Ii .	31·29	27	18,801½	600·80	2,632·32	917·42	29·32	128·19	4·88
5/Jj .	24	22·35	12,492½	520·52	2,922·03	548·72	22·86	126·13	4·39
5/Kk	20	12·68	7,393½	369·68	1,967·59	311·65	15·58	90·02	4·22
5/Nn .	23·97	21·97	14,381	599·96	2,976·58	640·63	26·73	138·62	4·45
5/Oo	21	18·45	10,855	516·90	2,621·31	472·53	22·50	119·19	4·35
5/Qq	19·71	16·13	9,117	462·55	1,950·17	460·82	23·38	105·76	5·05
5/Rr	24	15·61	5,158	214·92	1,578·54	275·11	11·46	91·84	5·33
5/Ss .	16·06	15·94	9,140½	569·14	2,546·99	417·22	25·98	116·27	4·56
5/Tt	10·10	10·10	5,488½	543·41	2,921·08	288·03	28·52	152·45	5·25
5/Uu .	22·68	18·06	8,368	368·90	1,977·79	376·49	16·59	88·59	4·46
5/Vv	22	11·45	3,966½	180·29	2,330·69	178·26	8·10	104·80	4·49
Means	27·27	22·69	12,085·67	443·13	2,348·10	577·70	21·18	113·95	4·78

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR JANUARY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during January.	Per Cow during January.	Per Cow December to January.	Per Herd during January.	Per Cow during January.	Per Cow December to January.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B	19	17·10	6,977	367·21	824·85	329·87	17·36	38·40	4·73
6/C	16·89	16	10,024	611·59	1,328·46	441·30	26·92	59·51	4·40
6/F	25	16·90	11,023½	440·94	1,078·40	573·44	22·94	53·61	5·20
6/H	25	24·68	13,957½	558·30	1,210·54	753·23	30·13	59·44	5·40
6/Y	18·97	12·97	8,153½	583·64	1,126·10	376·13	26·92	51·48	4·62
6/Ii	30	26·84	22,459½	748·65	1,326·78	945·71	31·53	55·95	4·22
6/Ll	21·61	16	12,595	582·83	1,200·91	502·25	23·24	48·25	3·99
6/Oo	17	16·10	15,149	891·12	1,904·09	689·58	40·56	85·42	4·55
6/Pp	15	9·35	6,759½	450·63	1,001·63	339·22	22·61	49·29	5·02
6/Qq	24·35	23	24,598½	1,010·21	2,042·31	1,043·66	42·86	87·06	4·24
6/Rr	29	25·94	27,148	936·14	1,765·95	1,133·47	39·09	74·31	4·18
6/Tt	20·71	19·19	15,599½	753·23	1,585·40	695·35	33·58	70·40	4·46
6/Vv	21	19·16	18,283½	870·64	1,827·83	804·13	38·29	83·50	4·40
6/Xx	24	18·06	18,134½	755·60	1,562·83	736·18	30·67	63·92	4·06
6/Yy	32·65	24·39	16,074	492·31	1,040·01	829·23	25·40	52·03	5·16
6/Zz	26·19	23·16	21,338½	814·88	1,634·49	939·52	35·88	71·75	4·40
6/Aaa	20	18·87	4,718	235·90	706·82	275·69	13·78	38·69	5·84
6/Bbb	24·87	22·97	21,097	848·29	1,676·87	866·71	34·85	68·40	4·11
6/Ccc	19·19	19	14,260	743·09	1,528·27	567·07	29·55	61·90	3·98
6/Ddd	20	18	15,453½	772·68	1,523·21	639·74	31·99	67·12	4·14
6/Eee	25·10	24·10	23,362½	930·77	1,991·87	995·58	39·66	81·82	4·26
6/Fff	24·58	24·26	23,022	936·61	1,762·18	976·73	39·74	74·91	4·24
6/Ggg	23	19·23	20,116	874·61	1,662·76	836·72	36·38	68·66	3·96
Means	22·50	19·79	16,100·17	715·41	1,456·29	708·28	31·47	64·01	4·40

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Journal of Agriculture, January and July, 1921.

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OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breeds—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1.—WHITE LEGHORNS.

Competitor.	Address.	Score to Month ending February 28th, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
S. Austwick	West Marden	(1) 199	(2) 202	(3) 134	535
C. R. Barker	Edwardstown	(4) 69	(5) 155	(6) †	224
H. Bolland	Knoxville	(7) †	(8) 188	(9) 154	342
A. Butson	Clarence Park	(10) 177	(11) 141	(12) 191	509
A. B. Carmichael	Woodville West	(13) dead	(14) †	(15) †	—
Carroll & Leedham	Forest Gardens	(16) 113	(17) 190	(18) 203	506
W. A. Carter	Glandore	(19) 164	(20) 183	(21) 141	488
W. L. Cleland	Beaumont	(22) 176	(23) 151	(24) dead	327
B. Cooke	Kanmantoo	(25) 104	(26) 168	(27) 217	489
Syd. Cooper	Edwardstown	(28) 159	(29) 137	(30) 174	470
L. H. Crawford	Grange	(31) dead	(32) 147	(33) 167	314
R. C. Crittenden	Kilkenny North	(34) 176	(35) 227	(36) 233	636
A. G. Dawes	Glenunga Gardens	(37) 220	(38) 178	(39) 187	585
A. G. Dawes	Glenunga Gardens	(40) 143	(41) dead	(42) *	143
A. G. Dawes	Glenunga Gardens	(43) 192	(44) 143	(45) †	335
A. G. Dawes	Glenunga Gardens	(46) 185	(47) 178	(48) 129	492
A. G. Dawes	Glenunga Gardens	(49) 132	(50) 164	(51) 184	480
A. G. Dawes	Glenunga Gardens	(52) 163	(53) 241	(54) 162	566
A. G. Dawes	Glenunga Gardens	(55) 201	(56) dead	(57) 178	379
T. Duhring	Mallala	(58) 141	(59) 165	(60) 185	491
Colin J. Easther	Black Forest	(61) 198	(62) 163	(63) 211	572
J. L. Edgcumbe	Plenty, Victoria	(64) 209	(65) 198	(66) †	407
H. Fidge	Clarence Park	(67) 132	(68) 178	(69) †	310
Russell H. Fox	Edwardstown	(70) 163	(71) 130	(72) 212	505
L. H. Gilbert	Glanville Blocks	(73) 102	(74) †	(75) 174	276
Keith Goldsmith	Kensington	(76) 215	(77) †	(78) †	215
A. G. Gore	Summertown	(79) 221	(80) †	(81) 192	413
A. & H. Gurr	Scott's Creek	(82) 136	(83) 196	(84) †	332
H. H. Hefford	Murray Bridge	(85) †	(86) †	(87) 191	191
H. H. Hefford	Murray Bridge	(88) 210	(89) 159	(90) †	369
Jas. Hillyer	Kilkenny	(91) 180	(92) 194	(93) 200	574
W. H. A. Hodgson	Salisbury	(94) 124	(95) 131	(96) 135	390
E. A. Lamerton	Edwardstown	(97) 131	(98) 103	(99) †	234
E. F. Lindquist	Semaphore Park	(100) †	(101) 202	(102) 192	394
Mrs. P. G. Lindsay	Croydon	(103) 153	(104) 145	(105) *	298
H. Morris	Seaton Park	(106) 170	(107) *	(108) 140	310
K. R. McPherson	Blackwood	(109) *	(110) *	(111) 97	97
H. R. Nicholls	Eden Hills	(112) †	(113) †	(114) *	—
J. H. Oliver	Goodwood Park	(115) 173	(116) †	(117) †	173
T. B. Radbone	Colonel Light Gdns.	(118) 159	(119) 147	(120) 152	458
H. A. Rassmussen	Ethelton	(121) 193	(122) 142	(123) †	335
Woodbury Poultry Farm	Crafers	(124) †	(125) 50	(126) 170	220
Woodbury Poultry Farm	Crafers	(127) 175	(128) 210	(129) 191	576
Bruce Rowe	Two Wells	(130) 218	(131) †	(132) 178	396

Egg-laying Competition—Section 1—White Leghorns—*continued.*

Competitor.	Address.	Score to Month ending February 28th, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 145	(134) *	(135) 212	357
W. C. Slape	Magill	(136) 223	(137) 162	(138) 212	597
Thomas & Elson	Hawthorn	(139) 186	(140) 148	(141) 159	493
Thomas & Elson	Hawthorn	(142) 204	(143) 196	(144) 193	593
C. C. Vowels	Westbourne Park	(145) 181	(146) 194	(147) †	375
F. F. Welford	Colonel Light Gdns.	(148) 121	(149) 145	(150) 185	451
A. P. Urlwin	Balaklava	(151) 153	(152) 162	(153) 164	479
W. Wiese	Cabra	(154) dead	(155) 139	(156) †	139
W. Wiese	Cabra	(157) †	(158) †	(159) †	—
F. J. Williams	Millswood Estate	(160) †	(161) 176	(162) †	176
W. R. Williams	Frewville	(163) 168	(164) 165	(165) dead	333
W. R. Williams	Frewville	(166) 213	(167) 112	(168) 193	518
W. Woodley	Tailem Bend	(169) 164	(170) 183	(171) 155	502
D. C. Connor	Gawler	(172) *	(173) 198	(174) 185	383
A. E. Tolhurst	Torrens Park	(175) 153	(176) †	(177) 146	299
A. & H. Gurr	Scott's Creek	(202) †	(203) †	(204) 199	199
Totals		7,887	7,286	7,077	22,250

Section 2—Any other Light Breed.

Black Minorcas.

V. F. Gameau	Woodville	(178) 125	(179) 136	(180) 147	408
Totals		125	136	147	408

Anconas

W. R. Williams	Frewville	(181) 141	(182) 138	(183) †	279
Totals		141	138	†	279

Section 3—Black Orpingtons.

N. F. Richardson	Woodville	(184) 95	(185) 235	(186) 187	517
Arthur Cook	Colonel Light Gdns.	(187) 215	(188) †	(189) *	215
B. Cooke	Kanmantoo	(190) †	(191) †	(192) 136	136
Jack Crago	Prospect	(193) 147	(194) 125	(195) *	272
L. H. Crawford	Grange	(196) 192	(197) 157	(198) 147	496
J. H. Dowling	Glossop	(199) †	(200) †	(201) †	—
F. J. Hudson	Prospect	(205) 188	(206) 165	(207) †	353
H. J. Mills	Edwardstown	(208) 174	(209) 220	(210) 244	638
H. J. Mills	Edwardstown	(211) 134	(212) 264	(213) †	398
J. Rawe	Seaton Park	(214) 220	(215) †	(216) †	220
B. O. Schubert	Tanunda	(217) 136	(218) †	(219) 119	255
G. Frisby Smith	Fulham	(220) 170	(221) 163	(222) 211	544
H. L. Twartz	Gawler	(223) 174	(224) 192	(225) 209	575
W. R. Williams	Frewville	(226) 209	(227) *	(228) dead	209
W. R. Williams	Frewville	(229) 182	(230) 203	(231) †	385
W. Woodley	Tailem Bend	(232) †	(233) 233	(234) 236	469
Totals		2,236	1,957	1,489	5,682

Section 4—Any other Heavy Breed.

Rhode Island Reds.

H. Fidge	Clarence Park	(235) 171	(236) 170	(237) 146	487
V. F. Gameau	Woodville	(238) 200	(239) 158	(240) dead	358
W. R. Williams	Frewville	(241) 165	(242) dead	(243) 162	327
Totals		536	328	308	1,172

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† Denotes disqualified under Rule 13. * Denotes did not lay during July.

PAPERS READ AT CONFERENCES.

LOWER NORTH BRANCHES, AUBURN, FEBRUARY 23rd, 1933.

CO-OPERATION AND ITS BENEFITS.

[G. TURNER (Penwortham).]

The English meaning of "Co-operation" is joint labor, or a concurrent effort, by which should be obtained a more satisfactory result. The English-speaking race has inherited from far-off ancestors the trait of independence, which has at times caused a loss, in different ways, either to the individual or the nation. But, nevertheless, that independence, coupled with grim determination, has had a bearing on her position as a race in the world to-day; and that very familiar expression, "Mind your own business," is often uttered, and, no doubt, there are occasions when the remark is justified, either as a rebuke or advice. But if everyone were to concentrate exclusively on minding his or her own business, the world—though perhaps it does not look too hopeful at present—would indeed be in a worse state, and a state of greater ignorance.

Man, the highest of all animals, has attained the state which we call civilisation only by joining with his fellows and others, and thus we see the greater nations have risen by working together, a uniting of the forces of man.

When countries were continually in conflict with others the nation remaining free from quarrelling internally rose to the top. When its attention had been directed on "individual first" it began on the down grade. So now the position of England is greatly due to her sane outlook towards a satisfied population, and the practice of co-operative methods—more particularly during the last decade—has, by its adoption in many countries, proved satisfactory.

Russia, China, Argentine, and the United States of America have co-operated in the buying and selling of nearly every commodity for the benefit of their inhabitants. To-day Great Britain supplies the wants of nearly half her population through its many and varied co-operative societies; and these societies have sprung up all over the world.

The motto of the great co-operative movement in Great Britain, Belgium, and Denmark is "Each for all and all for each." In Great Britain alone the membership numbers six millions, and does business amounting to hundreds of millions sterling per annum. The surplus of the respective movements is divided amongst its member customers. In proportion to their purchases, after paying a moderate rate of interest on their own capital used in the business, and, according to law, no individual can hold more than £200 worth. Should the aggregate capital be more than is required, it can be returned without the option of the holders; and so what is known to these "co-operators" as "co-operative" character is developed to an astonishing degree.

To-day the people own some of the largest productive concerns in the Empire, representing bootmaking, flour milling, soap milling, and weaving in all its branches. These works are controlled democratically on the one member one vote system. Last year its own banking account ran into £800,000,000 sterling. Headway is being made in the United States of America by co-operation, as the total business transacted by the associations during 1930-31 amounted to £480,000,000 sterling, compared with £460,000,000 in 1927-28, when the price level was much higher. Denmark, by her co-operative methods, has developed her dairying industry to an extent which is envied by all other countries. Something must be done immediately in this State for this industry, which is falling back with the other States which have adopted co-operative methods.

International co-operation is the great ideal. It, however, is still only a minor factor in commerce between nations, but its adoption would assuredly lead to financial and economic emancipation. Co-operation begins at home, and there are opportunities for practical co-operation in every district in South Australia. It should be hard to find a body of men more willing to help one another than the primary producers, and, when directly approached, they should always be ready to explain their methods of production.

But there is room for co-operation in minute things, *e.g.*, the rabbit pest. It is notorious that a man may constantly reduce the number of rabbits on his property, and still suffer damage to his crop because his neighbor is not joining him to exterminate the destroyers. The rapid spread of noxious weeds in this district undoubtedly makes it impossible for the owner to check the spread in some areas, but, where conditions allow, it should be regarded as a public duty to try to exterminate them. These are a few ways in which local co-operation can be carried out, but the practice of co-operation on the farm and orchard will develop the meaning of "strength and unity." The horse should be a partner, not a four-legged machine. We expect horses to co-operate; therefore we should meet them half way, and attend to their needs and ailments at correct times.

Avail yourself of the co-operation of others who are willing to co-operate with you in the Government Experimental and Instructional Departments. These departments are in existence not for the purpose of finding someone a soft job, but to help us to co-operate with Nature, with the result of producing something profitable from the land. Finally, there is that very practical co-operative association, the Agricultural Bureau, which will, in the future, be something more valuable than it is now given credit for.

Experience—the hardest, but perhaps the most successful of teachers—may show one a better way of doing a thing, but unless you consider it such a brilliant discovery that you intend keeping it closed by taking out rights, it is up to you, as a member of the Bureau, to bring it under the notice of other members. It may save them pounds. Look which way you will upon co-operation, nothing derogatory can be said against the movement. It has everything to commend it, for in whatever avenue it is applied the united effort will be a boon to mankind, for upon the prosperity of one man depends the prosperity of another, as does the prosperity of one nation on another.

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THE DESTRUCTION OF NOXIOUS WEEDS.

[W. R. JONES (Wirrilla).]

It is with deep concern that one views the rapid spread of noxious weeds, which in many cases is caused by the neglect of property owners. If noxious weeds are not controlled, it is only a matter of a few years until the land will greatly depreciate in value. Already, in this district and many others, star and saffron thistles have so overrun first-class wheat growing country that the natural stock foods are smothered, and sheep will not attempt to cross a paddock except on well beaten tracks.

In addition to this serious grazing loss, there is the great inconvenience of having the harvesting machines continually choked, and thus causing a loss of time in the busiest season. Of course, the choking of machines may be partly overcome by opening the comb, but unfortunately this also allows wheat to pass through, and where this practice has been carried out the losses have exceeded a bag per acre. Again there is a further loss through dockage. In some cases this year the dock for noxious weeds has been as much as sixpence per bushel. On present prices this means a loss to the farmer of over 20 per cent.—surely a calamity in these times. Again, through competition in the wheat yard, wheat is passed that is certainly not first quality. The result is that merchants, when fixing their price, make allowance for this foreign matter, and the price is one penny or more below what first quality grain should be. This has been proved on several occasions by selling guaranteed wheat to millers.

The strict enforcement of the Noxious Weeds Act would certainly ruin many landowners to-day. There are many people who have purchased ground these last few years which was badly infested with noxious weeds. It would be quite unreasonable to expect them to eradicate the pest. Many have tried at least to prevent them getting any worse, and the results are a credit to them, and will mean pounds to them in the future that the neglectful person will not have. There are some weeds which are included in the Noxious Weeds Act that are not very much to worry about, and there are others that some stock will occasionally eat, unfortunately, after they have shed their seeds. The late grazing of the plant does not prevent the spreading of weeds. Sheep will eat the common saffron and star thistles. For a short period during exceptional times this might happen on fallow; but how are we going to fallow the hills? Surely no sensible man expects to grow wool on a sheep that is forced to eat noxious weeds?

If a neighbor's mongrel ram gets to our stud ewes we soon make a noise and start claiming damages; and the same applies to other stock; yet the same neighbor can flood the land with noxious weed seeds and get away with it. What is the difference?

A very serious weed, known as Hoary Cress, is making its appearance in many districts; for such weeds as this the Act should be strictly enforced. There are other weeds that cannot be eradicated, but farmers can at least stop them from spreading to their neighbours.

The writer then moved the following resolution:—''That every property owner be compelled to cut all noxious weeds along half the road adjoining his property, also a distance of one chain inside his fence, and all boundaries dividing his property from his neighbor's.'' To prevent cutting after seed has ripened, it is suggested ''That the various District Councils fix the latest date suitable for their district.'' The resolution was lost.

DAIRYING.

[L. H. GILES (Wirrilla).]

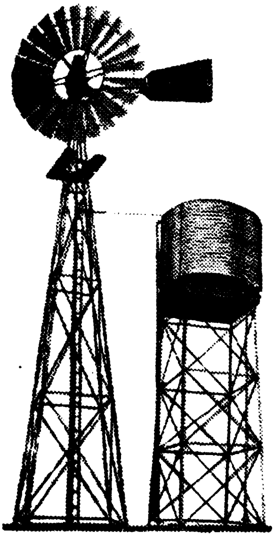
Three of the most important parts of dairying are testing, feeding, and breeding. It is necessary to find out as early as possible which are the good cows, and which cows are boarders. There is little enough in good cows, and less still in bad ones. The only way of finding the bad ones is by weighing the milk from each cow and testing it. That should be done as nearly as possible at regular intervals, say, every 30 days. On testing it is necessary to see that the cows have exactly the 24 hours for the day's milk. Keep a proper record of all tests, both milk and butter fat. It is advisable to weigh all the milkings; this gives a chance to find anything wrong with a cow at once, for the first symptom of illness is usually a falling away in the milk. It also keeps a check on the feed, though it does not always mean that a falling away in milk is a falling away in butter fat. It is necessary to have a Babcock tester, and to understand something of testing milk if one is going to test on the farm, but, failing that, the factory manager will do the testing. The Government will also do the testing for a small fee.

As soon as it is proved that a cow is a bad one, turn her out and fatten for the butcher, but do not take it for granted that a cow is a poor cow because one test is bad.

FEEDING.

Before testing, it is essential to feed reasonably well. It is impossible to get good returns from a cow unless she is given a certain amount of feed from which to produce milk and butter fat. Test a herd of dairy cows that are poorly fed, and then test them again after being well fed, and it is quite probable that it will then be shown that their relative positions as to good and bad have very much changed. Some cows when well fed simply put fat on to themselves instead of into the bucket. A cow of that class will not pay to hand feed.

Feeding dairy cows is a science in itself, and each individual cow must be carefully watched, for it is easy to give a cow so much of a certain fodder that she will produce less, and not more. For that reason I do not believe in mixing the feed for the whole herd in one bin, as so many do, and then giving different quantities to individual cows. Some cows can consume a great deal more concentrates than others without hurting them.



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Feeding can be divided into two parts. No. 1 is what they get in the paddocks while grazing; and No. 2, that part given them by hand-feeding. If hand-feeding is to be profitable, when butter fat is only 9d. per pound, it is necessary to use fodders that are very cheap. At the present time crushed oats stand alone as the cheapest food for cows; but always remember that feeding crushed oats can easily be overdone. A little too much, and they cause several complaints—indigestion, boils, mammitis, and other complaints of the udder. When feeding oats it is always advisable to feed a little bran; oats are very heating, and cause constipation. At this time of the year, when so many cows are running on the stubbles and getting grain in them with no green feed, it is very easy to overdo the oats. As soon as there is any sign of indigestion, give the cow a drench and put her on to bran and hay.

Linseed meal is another good fodder for cows. In fact, it is almost a necessity for show purposes in a dry district like this; but do not think it will pay you back £13 per ton in butter fat, with butter fat at 9d. per lb. One pound of crushed oats and 1lb. bran will produce more butter fat than 1lb. linseed meal. In this district cereal chaff is usually cheap, and can be fed with the concentrates—either oaten or wheaten chaff. The grazing for the cows does not receive sufficient attention. Topdressing the pastures for cows is essential; it is possible to carry twice the stock after topdressing has been practised. The quality of the feed is also very much better. Topdressing with superphosphate has done away with the old complaint of dry bible, and it greatly reduces the chance of milk fever.

PASTURES.

There are also many kinds of grasses that can be planted to supplement the natural grasses. Wimmera Rye Grass has been quite successful with us, and it is still improving. We have tried Subterranean Clover and have found it partially successful, it grows on the southern sides of the slopes, but on the northern sides it has not been a success. The better the pastures are, the less has to be hand-fed to keep the cows up, but it does not pay to let the cows go back too much before starting hand-feeding.

PURE-BRED BULLS.

There has been a considerable improvement in the individual returns from cows in South Australia and most of that improvement can be attributed to the Government subsidising the sale of pure-bred bulls. It has been the means of many buying good pure-bred bulls who were only using mongrels before; and as only the calves from good producing dams are subsidised, it means that pure-bred stock are rapidly gaining in favor. The next move from the Government is now long over-due, that is either to put an extra tax on the scrub bull or to stop him being kept at all.

It is no good breeding from a bull just because its dam was a good cow. Use bulls with good pedigrees, from stock that have been good producers for generations.

If farmers would take the same interest in getting the best cows possible as they do in getting the best seed wheat there would be a still greater improvement in the dairying industry. In selecting wheat, farmers usually buy seed from a neighbor who is growing big crops. If that is wise—and it certainly is—why not buy bulls from the neighbor who has big producers. Only a few years ago 130lbs. of butter was given as the average from all cows in South Australia. Last year all Friesian cows under test in South Australia averaged 440lbs. of butter fat, which means that one Friesian cow last year gave as much as three average cows of a few years ago. Denmark gets about that average per cow for all cows, so why cannot South Australia? Over most of South Australia our climate is nearly ideal for dairy cows. So why is it our figures are as poor as they are? The chief cause of it is the scrub bull, and the sooner something more is done to get rid of him the better. One reason why we do not improve faster is because so many will not be taught what a good cow should give. One often hears of a good cow that makes 10lbs. or 12lbs. of butter a week. A cow that will only do that at her best is not a good cow. On the Adelaide Show Grounds last year, competing for the Garden and Field Trophy, Mr. Morris's Friesian cow made at the rate of 35lbs. of butter per week and our Friesian cow that came second made more than 30lbs. per week. They are good cows, not the ones that make 10lbs. or 12lbs. per week.

If only good bulls were kept and a little more scientific feeding and testing carried out to find out the bad ones, then the increase in the butter export of South Australia would be astonishing.

FARM MANAGEMENT.

[A. L. Sandow (Wirrilla).]

To deal with this subject, one could not do better than use his own holding as a means of illustration, taking a farm of approximately 1,800 acres, including in this area about 200 acres of grazing land, portion of this farm now being in the possession of the third generation. To give some idea as to the management over a five-year term, for the preparation for seeding and harvesting and stock carrying capacity and caring for same, firstly, I suggest fallowing 600 acres, putting the farming part of the management the first consideration. Under recent conditions it has been difficult to put wheat growing in the first place. But presumably we have passed through the 1s. 6d. a bushel stage, and are living in hopes on the basis of better prices; I maintain that wheat growing is our occupation and we cannot do better than stick to our jobs. To handle an area of 600 acres, the plant I use is as follows. Two ploughs, 1-6 and 1-7 furrow, two 17-tine stump-jump cultivators, one 12ft. spring-tooth, two 16-hoe combines, and two 10ft. headers and 20 harrows used cautiously. As for power, I suggest one good 10-horse team, with a spare horse and a tractor. Start fallowing with the team almost immediately after seeding, preferably on ley ground. Work the

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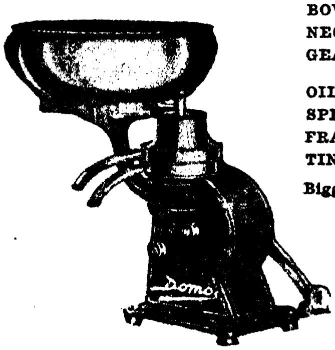

land on the third year system, which is commonly known as ley ground. Fallowing ley ground is proving the most profitable system on which to work. To get this area of fallow out of a farm of this size, and having 200 acres of grazing land in the farm, leaves hardly sufficient to have all ley ground to fallow. To keep up the fallowing area, fallow a stubble paddock, which was ley ground the previous fallowing. To start fallowing with the tractor, hold up the tractor until later in the season, thus saving the feed for the sheep. It is good management to keep the team occupied, as the horses have to be fed, whereas the tractor can remain idle, costing nothing while not working. Six hundred acres are comfortable working for a team and a tractor, but in this country where wet conditions prevail, this area thoroughly worked and managed will prove a good proposition in conjunction with the stock. As often is the case, it is not always possible to get the land altogether or joining. Therefore, work the team in the nearest paddocks to the stable, thus saving travelling, and the tractor doing the far away paddocks. For working down of this fallow, use the harrows very sparingly, perhaps not at all, unless a season such as last year is experienced, when feed had to be levelled to get the cultivators over it.

For cultivating, use good stump-jump or set cultivators. Perhaps a little discretion may be used here on the late fallowed paddocks, but early fallowed land is generally too solid for spring-tooth implements. On red soil, the cultivator is needed to bring the fallowed land up again. This cultivation should be all that is necessary until after harvest. Make the sheep do the rest, they are a big factor in preparing proper fallow. The sheep should keep the land clean until the cultivation before seeding, the less the land is worked the less the cost of production. The spring-tooth or combine could do this cultivation.

SEEDING.

This is the most important item of the farm management. The condition of getting a crop in right and at the right time is the secret of a good crop. Given land in good heart and getting a crop in in the best conditions almost assures a good return in this sure district. Put in about 50 acres of oats on stubble land for hay to feed the horse team, thus saving cutting into the fallow crop for hay, again reduces the cost of production, which is so essential these days. Also put more of the stubble land paddocks which are intended to be left as ley ground, into oats for sheep feed. The feeding of these oats off for sheep feed and the manuring of the ground must certainly enrich the ground.

Failing sowing oats on these paddocks, seed Wimmera rye grass in the super of the preceding wheat crop grown.

HARVESTING.

Put the 10-horse team on a 10ft. header and the tractor on another 10ft. header. The team, being well cared for and tuned up to concert pitch for the job, is available for this purpose, as also is the tractor. The tractor, with one 10ft. header, can be kept going almost continuously. The invested capital in the tractor is standing idle if other motor power is used. With a valuable stock and plant, the most economical working is to use the plant to its fullest capacity. The extra quantity which is worked helps to give a greater margin of profit on the year's transaction.

Another neglected point is the overhauling of the machines in slack time, and having them ready to start when required. Many small jobs can be done by the farmer, providing he has time. If left, it often means delay at a busy season. It is sound economy to keep all machinery well housed and protected from the fowls. That "stitch in time" still holds as good as ever it did. The harvest is then safely gathered, and the wheat delivered to the station.

The next step of importance is the disposing of the crop. A general practice, which is sound, is to sell at least half of the crop on delivery at the station, and more often three-quarters is disposed of within a month after being delivered. Storing wheat persistently is not sound economy, whichever way it is viewed, because of losses made through being unable to pay or earn interest while the storing continues, or through capital being tied up.

There is another aspect of the question, and that is to put ourselves, if possible, in a position to pay cash for farm requirements by selling our wheat. The cash principle is a guard against over-stepping one's financial boundary and getting into difficulties so easily done these times.

Another point where management can be improved is in the purchasing of cornsacks. If farmers could only collectively buy, say, 50 or 100 bales, we could certainly buy to a big advantage. A Bureau Branch could estimate its requirements, and secure them early in the season, which is nearly always sound buying.

Furthermore, if bulk handling could be solved, what an amount could be saved in cornsacks, even if this amount were put to financing a bulk handling system for a few years.

Under the management indicated, the average over the five years on the area reaped has been 8 bags to the acre. To give a few details of how this average is obtained:—The number of acres reaped during the five successive years in question totals 2,856, returning 22,901 bags. One season in particular—the 1930 harvest—the farm produced 6,054 bags off 616 acres, which very considerably helped to make the favorable average over the five years. The principal varieties grown during this period were Gallipoli (about 50 per cent.), and the other 50 per cent. made up of Sepoy and Wannon. All brown wheats are popular varieties in this district.

A record of the returns of every paddock is entered at the completion of harvest in a book especially kept for this purpose. This book contains a record of the last 15 harvests. This is not more than any farmer should make a practice of doing. A similar record is kept of the wool returns. It is very interesting to have a perusal of these records, and see the various prices received, and compare them with the present day prices.

STOCK.

The sheep on the farm carried annually is a line of 650 Merino ewes of rather a plain-bodied type, crossed with Dorset Horn rams, and about 300 to 400 young sheep of mixed sexes generally. This line of sheep is a great asset to the farming part of the business, and makes one wonder how a farm could be run without sheep, keeping all paddocks cleaned up nicely ahead of the ploughs. A good idea is to shear this line of sheep fairly early. They are better able to get over the fallows, and clean up the rubbish in spring. Breeding ewes should be crutched a month before lambing, thus minimising blowfly trouble. The flock should be visited at least once a day during lambing, and, at the very outside, every other day. Leave the dog home. Tailing should be done as soon as possible after lambing, taking careful observation that the lambs do not get too big, using, preferably, the knife for the operation. The cross-bred lamb seems to suit the farmer's feed best, generally speaking. As fallowing is completed the feed gets less, and the lambs are beginning to go away to market. Special care should be taken in sending lambs to market. One hardly realises how easily sappy spring lambs are bruised, which renders them useless for export.

A line of 20 young heifers proves a good sideline. They eat all the rank, coarse feed, which is useless to the sheep, and they can be managed to suit household requirements. If they are not wanted for that purpose, the calf runs with the mother, and very often will reduce the cost of the young stock quite a good percentage.

LABOR.

When one has not sons old enough to stand in on the job, the most satisfactory and convenient solution of the labor problem is to employ two married men. The men have their homes, and naturally there is more contentment and more satisfaction to both parties. A good principle where one has men constantly on the farm is to give the men some interest in the crop, say, a bag in every hundred, or a number of acres of the average on the crop reaped.

Another point worthy of mention is the farm vegetable garden. Of course, a water supply is of first importance, which, generally speaking, is easily acquired in this district. Given plenty of water, and a nicely netted-in patch not too far from the house, it is astounding what vegetables can be grown.

BULK HANDLING OF WHEAT.

[R. F. KELLY (Wirrilla).]

That bulk handling of wheat is long overdue is the opinion of a large number of men engaged in growing wheat. In other parts of the world bulk handling has been in vogue for many years. The United Kingdom receives 85 per cent. of her imports in bulk. Australia, it is reported, with three other countries—viz., India, California, and Chile—are the only exporting countries that still use bags. All of these countries, with the exception of India, ship some in bulk.

Bulk handling has many advantages. Besides being cheaper to handle, it is weather-proof, mouse-proof, and rat-proof. The South Australian Farmers' Union made a trial shipment last July, and, despite the fact that they had to handle the bags, cut them open, and tip the grain into the hold, they loaded nearly 2,000 tons a day, the loading charter of the boat being only 1,000 tons per day. The wheat was sold for three-sixteenths of a penny per bushel less than wheat in bags. The saving in bags alone would be over 2d. with bags at 8s. per dozen. Then there was a saving of 2s. 6d. per ton less carriage than wheat in bags. At a conservative estimate the saving on the trial shipment was 3d. per bushel. The saving directly to farmers before it gets to the silo is worth noting. If the wheat is put into bags they do not need sewing. In Western Australia it is claimed that full bags can be carted on a lorry over rough roads without loss. The cost of silos at sidings and shipping ports seems to have been the drawback.

Western Australian farmers have been experimenting with large bins made of galvanized iron. They put up five bins, capable of holding 1,270,000bush., with the necessary elevation, at the cost of £10,095. The wheat was transported to the seaboard in 80 steel trucks, which had been converted into bulk handling wheat trucks at the cost of £940. It is estimated that this State could be equipped with silos at a cost of £1,500,000. When it is considered that last season's bags cost, in round figures, £500,000, this sum is not large, and could be paid for at the rate of 1d. per bushel.

Another great advantage of having the wheat in silos is that for every given number of bushels the farmer would be given a certificate that would be transferable. This would be a much better way of storing wheat than that we have at the present time. It would be as good as free wheat, and could be sold to any merchant or miller at full market rates. Farmers should study this subject fully, and if it is considered that bulk handling would be an advantage, bring pressure to bear on the Government for permission to erect trial silos or bins for bulk handling of wheat.

DISEASED SWEET MELON.

Specimens of a sweet melon vine showing evidence of disease were received from Lyndoch. These were submitted to Mr. G. Samuel, M.Sc. (Waite Research Institute), for identification, who reports that the fungus on the stem of the sweet melon plant was a Myxomycete, probably *Fuligo* sp. These are purely saprophytic fungi, which live as a "plasmodium," or naked jelly-like substance, on soil rich in organic matter. While in this stage they have the power of movement, and "flow" gradually over the surface of the soil, and when the time approaches to form spores, they usually go up on to stems or grass leaves and gradually change to the black powdery mass of spores surrounded by a brittle white wall, which was the stage on the melon stems forwarded. They do no harm to vegetation.

STATE OF SOUTH AUSTRALIA.

WINE INDUSTRY.

[W. L. Johnston, Government Statist.]

1. *Stocks of Wine, December 31st, 1932.*

These have been estimated from returns received from the Wine manufacturers and are as follows :—

Year (December 31st).	Wine for Beverage.	Wine for Distillation.	Total.
	Galls.	Galls.	Galls.
1928	9,400,000	260,000	9,660,000
1929	9,430,000	1,610,000	11,040,000
1930	10,570,000	500,000	11,070,000
1931	11,010,000	360,000	11,370,000
1932	12,230,000	150,000	12,380,000

2. *Last Five Years' Exports of Wine and Brandy.*

Year (June 30th).	Oversea Countries (Direct).	Interstate.		Estimated Total Export Value.
		Wine.	Brandy.	
	Galls.	Galls.	Pf. galls.	£
1928	2,856,806	2,216,875	144,489	1,695,255
1929	1,423,799	1,940,065	123,416	1,206,490
1930	1,840,539	1,910,965	125,179	1,237,980
1931	1,837,986	1,462,554	82,295	992,075
1932	3,035,127	1,318,224	100,767	1,341,958

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3. *Exports to other States*, 1931-32.

State.	Wine.		Brandy.	
	1931-32.	1930-31.	1931-32.	1930-31.
	Galls.	Galls.	Pf. galls.	Pf. galls.
New South Wales	558,236	595,589	62,901	46,359
Victoria	453,661	539,218	17,416	17,993
Queensland	145,814	155,143	7,903	8,344
Western Australia	136,309	151,220	11,928	9,110
Tasmania	24,204	21,384	619	489
Total	1,318,224	1,462,554	100,767	82,295

4. *Distillation.*

Year. (June 30th).	Wine Used.	Spirits Distilled from Wine.		
		Total.	Brandy.	Fortifying Spirits.
	Galls.	Pf. galls.	Pf. galls.	Pf. galls.
1928	10,535,440	1,710,101	260,043	1,450,058
1929	9,259,127	1,592,428	386,426	1,206,002
1930	9,505,574	1,709,069	535,467	1,173,602
1931	7,340,448	1,252,953	306,367	946,586
1932	7,176,669	1,155,225	156,212	999,013

RETURN OF EGGS AND EGG PULP EXPORTED FROM SOUTH AUSTRALIA TO EACH OF THE STATES AND TO OVERSEA COUNTRIES, JULY-DECEMBER 1932, 1931, AND 1930.

Compiled by the Government Statist from returns specially collected by him from Exporting Merchants.

The Grand Total Exports for the six months period (July to December) for each of the years 1930, 1931, and 1932 were £70,894; £154,347 and £245,228. The last six months show an increase of £90,881 over the same six months of 1931 and £174,334 over the same period for 1930.

The Grand Total six months Exports of Eggs in Shell and in Pulp in terms of Eggs in Shell is estimated to have been 1,300,000doz. for 1930 3,500,000 for 1931; and 5,000,000 for 1932.

The following are the details :—

State.	Eggs in Shell.		Egg Pulp.		Total Value.
	Doz.	£	Lbs.	£	£
New South Wales (Ex. B.H.)	108,008	4,568	423,378	12,127	16,695
Broken Hill	48,437	2,146	9,484	254	2,400
Victoria	133,184	5,362	210,700	5,839	11,201
Other States	13,867	670	114,280	3,005	3,675
Total Interstate, 1932	303,496	12,746	757,842	21,225	33,971
1931	439,879	15,278	595,077	22,840	38,118
1930	336,064	18,811	287,538	10,472	29,283
Oversea (Direct), 1932	3,724,080	192,982	475,000	18,275	211,257
1931	2,026,220	88,017	735,000	28,212	116,229
1930	772,680	41,301	8,000	310	41,611
Grand Total 1932	4,027,576	205,728	1,232,842	39,500	245,228
1931	2,466,099	103,295	1,330,077	51,052	154,347
1930	1,108,744	60,112	295,538	10,782	70,894

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

RIVER MURRAY SWAMP SETTLERS' CONFERENCE.

The Second Annual Conference of Settlers on the Swamps of the Lower Murray was held at Murray Bridge on Thursday, February 16th.

Messrs. A. J. Cooke and P. J. Baily (Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Poultry Expert), P. H. Suter, R. Hill, and R. L. Griffiths (District Instructors), A. H. Robin, B.V.Sc. (Veterinary Officer), Drs. J. Davidson and J. G. Davies (Waite Research Institute), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary, Agricultural Bureau) attended on behalf of the Department of Agriculture.

Mr. P. J. Baily occupied the Chair, and the Conference was opened by Mr. A. J. Cooke.

The following addresses were given:—"The Best Type of Dairy Cow for the Swamp Areas," Mr. H. B. Barlow; "The Raising of Poultry on Swamp Areas," Mr. C. F. Anderson; "The Control of Lucerne Flea," Dr. J. Davidson; "Pastures for the Swamps during Summer," Dr. J. G. Davies; "Diseases of Dairy Cattle," Mr. Alan H. Robin.

Conference carried the following resolutions:—"That this Conference urges the necessity for the introduction of a Pure Seeds Act." "That this Conference brings under the notice of the Department of Agriculture the need for a Veterinary Surgeon to be stationed at Murray Bridge." "That this Conference heartily supports the efforts of Mr. Anderson in seeing that the export standard of eggs is fully maintained."

LOWER NORTH CONFERENCE.

Branches of the Agricultural Bureau situated in the Lower North Districts of the State held their Annual Conference at Auburn under the auspices of the Wirrilla Branch on Thursday, February 23rd. A large number of delegates attended from the Lyndoch, Rosedale, Wirrilla, Alma, Light's Pass, Hoyleton, Williamstown, Tarlee, Penwortham, Farrell's Flat, Upper Wakefield, Saddleworth, Stanley Flat, Watervale, Greenock, Koonunga, Wasleys, Owen, and Riverton Branches.

Messrs. F. Coleman (Member Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Poultry Expert), M. W. Aird (Assistant Poultry Expert), W. C. Johnston, J. O. Hatter, and J. B. Harris (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary Agricultural Bureau), were also present.

The following papers were read and discussed:—"Co-operation and Its Benefits" (C. Turner (Penwortham), "The Destruction of Noxious Weeds" (W. R. Jones, Wirrilla); "Dairying" (L. H. Giles, Wirrilla); "Farm Management" (A. L. Sandow, Wirrilla); "Bulk Handling of Wheat" (R. F. Kelly, Wirrilla). Numerous questions included on the Agenda were discussed by Departmental Officers.

Resolutions as set out hereunder were adopted:—"That the 1933 Conference be held at Riverton." "That the railway concession on freight on superphosphate be extended to the 30th March." "That this Conference requests the Department of Agriculture, in conjunction with the Council for Scientific and Industrial Research, to conduct experiments in Mr. George Wishart's Garden (Angaston) by layering three rows of currant vines to compare with those now under rejuvenation experiment."

MIDLANDS CROP COMPETITION.

Mr. F. Coleman presented the prizes in the Midlands Crop Competition:—

1st—P. Smythe (Salters Springs), 94 points, 8-day clock.

2nd—W. H. Brown (Alma), 93 points, coffee service.

3rd—W. R. Woods & Sons (Wirrilla), 92 points, antique vases.

The Conference concluded with an address, illustrated with lantern views, "Breeds of Dairy Cattle and Pigs for Home and Export Trade," by Mr. H. B. Barlow.

The Secretarial duties of the Conference were in the capable hands of Mr. H. Schunke.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on February 22nd, there being present Messrs. A. J. Cooke (Vice-Chairman), J. B. Murdoch, P. J. Baily, A. L. McEwin, S. Shepherd, A. M. Dawkins, J. W. Sandford, F. Coleman, R. H. Martin, Dr. A. E. V. Richardson, and H. C. Pritchard (Secretary). Apologies were received from Mr. H. W. Wicks and Professor A. J. Perkins.

Leave of Absence.—The Hon. Minister of Agriculture approved of six months' leave of absence to W. G. Jeffrey, who is absent from Australia, and leave of absence until December 31st, 1933, to Mr. P. H. Jones on account of private business.

Life Members.—The names of Messrs. W. L. Pengilly and W. M. Hayes, of the Redhill Branch were added to the roll of Life Members of the Agricultural Bureau.

New Branches.—Approval was given for the formation of a Women's Branch of the Agricultural Bureau at Kybybolite with the following ladies as Foundation Members:—Mesdames L. J. Cook, E. C. Schinckel, H. B. Schinckel, A. H. Bradley, C. Hahn, E. H. Wilks, F. R. Moore, S. B. Castine, P. Heffernan, J. Heffernan, L. Shepherd, S. Shepherd, W. D. Kekwick, H. Miles, J. M. Wray, F. R. Moore, H. D. Irving-Miles, sen., Misses E. Kealey, A. Shepherd, T. Ansey, and R. Heffernan.

Conditional approval was granted for a New Branch at Sutherlands.

New Members.—The following names were added to the rolls of existing Branches.— Frayville—E. Wachtel, R. Wachtel, P. Bormann; Hartley—A. E. Jaensch; Balhannah—H. Usher, L. Beckwith, E. J. Pearson; Lameroo—J. O. Kernick; Saddleworth—H. G. Kingston; Roseworthy—C. W. H. Dahlenburg, G. Mitchell; Hope Forest—A. T. Jefferis. Robert Jefferis; Upper Wakefield—Roy Anderson, H. Shrubsole; Mount Compass—C. Brand; Parilla Women's—Mrs. G. Belling, Mrs. Smitham, Mrs. Doecke; Stockport—F. Cowley; Kybybolite—P. F. Giles; Kybybolite Women's—Mrs. L. J. Cook, Mrs. E. C. H. Schinckel, Mrs. H. B. Schinckel, Mrs. A. H. Bradley, Mrs. C. Hahn, Mrs. E. H. Wilks, Mrs. F. R. Moore, Mrs. D. H. Irving, Mrs. J. Heffernan, Mrs. Miles, sen., Mrs. L. Shepherd, Mrs. H. Miles, Mrs. J. M. Wray, Mrs. P. Heffernan, Miss Kealy, Miss A. Shepherd, Miss Tansey, Miss R. Heffernan, Mrs. S. B. Castine, Mrs. W. D. Kekwick.

No. of new members, 41; No. of present members, 8,347; No. of Branches, 325.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co., Limited, reported on March 1st, 1933—

Butter.—The usual seasonal decline in production has now set in, and supplies of cream to the factories are falling back rapidly. In some parts of the South-East, however, it is anticipated that early improvement in production will take place, as many of the dairymen there have cows coming into milk towards the end of March. In other parts of the State the decline must continue for several months yet. The quantity of choicest butter now being manufactured is not sufficient for local requirements, and consequently some importations of factory have been necessary. There is, however, still a surplus of lower grades. London markets are still depressed, although a slightly better tone was advised by cable this week. Choicest creamery fresh butter in bulk, 1s. 1½d. Prints and delivery extra. (These prices are subject to the stabilisation levies). Store and collectors, 7d. to 7½d. per lb, at store door, less usual selling charges.

Eggs.—The demand for eggs is keeping up well, more especially for prime quality guaranteed new laid, but other sorts suitable only for manufacturing purposes are not in such good request. Production is declining, but only gradually, and there is still a surplus over and above local requirements. Ordinary country eggs, hen or duck, 5½d. per dozen; selected, tested, and infertile higher.

Cheese.—Exporting has now ceased for the season and the tonnage shipped to Britain constituted easily a record. London advices indicated that the South Australian cheese had created a favorable impression in Britain, and except for isolated shipments the whole of the exports were entirely satisfactory. Values at present in the local market are:—New makes, large to loaf, 6½d. to 7d.; semi-matured and matured, 9d. to 11d. per pound.

Bacon.—The turnover in bacon this year has been greatly in excess of the average sales and is largely due to the fact that prices have been moderate in comparison with other foodstuffs. The supplies of live hogs in the various livestock markets have been large so that curers were kept busily employed in manufacturing. Some Interstate trade was negotiated each week, so that stocks have been kept down to satisfactory levels. Best local sides, 7½d. to 7¾d.; best factory cured middles, 7d. to 7½d.; large 6½d., rolls, 7d. to 7¼d. Hams, 11d. to 11½d. per pound; cooked, 1s. 0½d. Lard, prints 5d. per pound.

Almonds.—The new season's crop is now being marketed in increasing quantities, but so far the markets have been kept clear from week to week. Kernels also are selling readily and values are steady. Brandis and softshells, 8d. to 9d.; hardshells, 5d. per pound; kernels, 1s. 10d. to 1s. 11d. per pound.

Honey.—The stocks of honey are accumulating as the demand both locally and Interstate is still only limited. The quality of the new season's honey generally speaking is of a high standard of quality, but with the other States of the Commonwealth all producing greater stocks, the outlook is somewhat obscure. Prime clear extracted in liquid condition, 2¾d. to 3¼d.; lower grades, 1½d. to 2d. per pound.

Beeswax.—Supplies are now somewhat short of requirements, as apiarists have been kept busy on the honey extraction and have not had time to prepare the beeswax for market. The market therefore is somewhat bare at the present time, 1s. 0½d. to 1s. 1d. per pound according to sample.

Live Poultry.—The quantities marketed throughout February were more extensive than for the corresponding period last year, but unfortunately by far the larger proportion of the fowls were only light condition and partly matured stock. Values for these have ruled low, but prime quality birds were eagerly purchased, and satisfactory prices obtained. We advise consigning. Crates loaned on application. Prime roosters, 3s. 3d. to 4s. 3d.; nice conditioned cockerels, 2s. 6d. to 3s.; fair conditioned cockerels, 2s. to 2s. 5d.; chickens lower. Heavy weight hens, 2s. 3d. to 3s. 3d.; medium hens, 1s. 8d. to 2s. 1d.; light hens, 1s. to 1s. 6d. Couple of pens of weedy sorts lower. Geese, 3s. to 4s.; goslings lower. Prime young muscovy drakes, 3s. to 3s. 9d.; young muscovy ducks, 2s. to 2s. 9d.; ordinary ducks, 1s. 3d. to 2s.; ducklings lower. Turkeys good to prime condition, 10d. to 1s. 2d. per pound live weight. Turkeys fair condition, 7½d. to 9d. live weight. Turkeys fattening sorts lower. Pigeons, 3d. to 4d. each.

Potatoes.—Local new, 4s. per cwt.

Onions.—New season's, 4s. 6d. per cwt.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DECEMBER, 1932, AND JANUARY, 1933.

IMPORTS.

Interstate.

	Dec.	Jan.
Apples (bushels)	1,052	21
Apricots (bushel)	1	—
Bananas (bushels)	9,280	4,778
Citrus—		
Lemons (bushels)	55	24
Oranges (bushels)	6	4
Currants, black (bushels)	—	3
Passion fruit (bushels)	119	99
Peaches (bushels)	4	12
Pears (bushel)	—	1
Pineapples (bushels)	438	293
Strawberries (packages)	4	—
Tomatoes (bushels)	3	32
Peanuts (bags)	102	48
Peanuts, kernels (bags)	16	15
Cucumbers (bushels)	114	—
Potatoes (bags)	1,626	337
Swedes (bags)	—	16
Bulbs (packages)	21	39

	Dec.	Jan.
Moss (package)	—	1
Plants (packages)	26	30
Roots, grass (bag)	1	—
Seeds (packages)	65	58
Trees, ornamental (package)	—	1
Wine casks (No.)	2,220	2,542
Fumigated—		
Wine casks (No.)	21	32
Scalded—		
Wine caks (No.)	62	—
Rejected—		
Bananas (bushels)	15	40
Peaches (bushel)	1	1
Potatoes (bags)	12	—
Roots, grass (package)	1	—
Second-hand cases (No.)	2	7

OVERSEAS.

(State Law.)

Wine casks (No.)	479	401

Federal Quarantine Act.

	Dec. Packages.	Jan. Lbs.	Dec. Packages.	Jan. Lbs.
Seeds, &c.	3,629	348,346	5,508	966,313
Canes	106	—	107	—
Chests, cocoanut	695	—	20	—
Chests, tea	2,329	—	6,552	—
		No.		No.
Plants	2	50	2	259
		Sup. ft.		Sup. ft.
Timber	115,836	723,032	141,577	2,133,991

EXPORTS.

Federal Commerce Act.

		Dec. Pkgs.	Jan. Pkgs.
China	Peaches	—	2
	Pears	—	4
	Plums	—	5
	Vegetables	—	6
Netherlands, East Indies	Apples	—	1
	Nectarines	—	2
	Peaches	—	23
	Pears	—	2
	Plums	—	42
Singapore	Apricots	1	2
	Cherries	27	—
	Citrus—		
	Lemons	—	5
	Oranges	5	25
	Gooseberries	10	—
	Loquats	5	—

		Dec. Pkgs.	Jan. Pkgs.
Singapore	Peaches	—	8
	Pears	—	5
	Plums	4	6
	Vegetables	8	65
Straits Settlements	Apricots	—	1
	Cherries	5	—
	Citrus—Oranges	15	15
	Gooseberries	5	—
	Peaches	—	1
	Pears	—	1
	Plums	—	2
	Tomatoes	—	1
	Potatoes	10	10
	Other vegetables	5	2

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of February, 1933, also the average precipitation for the month of February and the average annual rainfall.

Station.	For Feb., 1933.	Av'ge for Feb.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.			
Oodnadatta	—	0·56	4·70
Marree	0·77	0·49	5·89
Farina	0·32	0·54	6·47
Copley	—	0·52	7·94
Beltana	—	0·66	8·54
Blinman	0·17	0·74	11·95
Hookina	—	0·42	11·53
Hawker	0·12	0·55	12·30
Wilson	—	0·60	11·78
Gordon	—	0·75	10·63
Quorn	—	0·56	13·29
Port Augusta ..	—	0·49	9·42
Bruce..........	—	0·54	9·93
Hammond	—	0·58	11·31
Wilmington	—	0·57	17·43
Willowie	—	0·69	12·19
Melrose	—	0·85	22·85
Booleroo Centre	—	0·63	15·15
Port Germein ..	0·01	0·48	12·43
Wirrabara	—	0·66	19·21
Appila	—	0·66	14·57
Cradock........	—	0·64	10·83
Carrieton.......	—	0·57	12·31
Johnburg . ..	—	0·53	10·61
Eurelia	—	0·62	12·87
Orroroo	—	0·63	13·21
Nackara	—	0·66	11·16
Black Rock	—	0·63	12·41
Oodlawirra	—	0·60	11·56
Peterborough ..	—	0·59	13·21
Yongala	—	0·67	14·42
NORTH-EAST.			
Yunta	—	0·60	8·50
Waukaringa ...	—	0·51	8·00
Mannahill	—	0·69	8·28
Cockburn	0·37	0·61	7·96
Broken Hill	0·25	0·86	9·63
LOWER NORTH.			
Port Pirie	—	0·50	13·17
Port Broughton	0·12	0·53	13·93
Bute	—	0·51	15·36
Laura	0·09	0·69	17·91
Caltowie	—	0·68	16·69
Jamestown	—	0·65	17·71
Gladstone	—	0·60	16·29
Crystal Brook ..	0·03	0·61	15·78
Georgetown	0·05	0·71	18·35
Narridy	0·15	0·61	15·85
Redhill	0·12	0·61	16·55
Spalding	—	0·78	18·99
Gulnare	0·08	0·79	18·56
Yacka	0·02	0·63	15·33
Koolunga	—	0·63	15·40
Snowtown	0·07	0·52	15·64
LOWER NORTH—*continued.*			
Brinkworth.....	—	0·66	15·74
Blyth	0·05	0·62	16·77
Clare	0·06	0·82	24·53
Mintaro	—	0·74	23·42
Watervale	—	0·78	26·91
Auburn	0·11	0·83	23·98
Hoyleton.......	0·15	0·55	17·32
Balaklava	0·06	0·56	15·49
Pt. Wakefield ..	0·01	0·64	12·93
Terowie	—	0·81	13·35
Yarcowie.......	—	0·70	13·57
Hallett	—	0·68	16·40
Mount Bryan ..	—	0·77	16·65
Kooringa.......	—	0·69	17·89
Farrell's Flat ...	—	0·64	18·65
WEST OF MURRAY RANGE.			
Manoora	0·02	0·62	18·83
Saddleworth ...	0·05	0·71	19·55
Marrabel	0·08	0·61	19·84
Riverton	0·08	0·67	20·75
Tarlee	—	0·64	18·11
Stockport	—	0·60	16·88
Hamley Bridge .	—	0·65	16·54
Kapunda.......	0·02	0·69	19·79
Freeling........	—	0·62	17·85
Greenock.......	—	0·70	21·56
Truro	0·03	0·68	19·96
Stockwell	—	0·71	20·12
Nuriootpa	—	0·66	20·64
Angaston	0·03	0·71	22·43
Tanunda	0·05	0·66	22·02
Lyndoch	0·06	0·70	23·45
Williamstown ..	0·05	0·72	27·71
ADELAIDE PLAINS.			
Owen	0·04	0·90	14·33
Mallala	—	0·62	16·56
Roseworthy	—	0·58	17·34
Gawler.........	0·01	0·69	18·96
Two Wells	—	0·55	15·70
Virginia	—	0·59	17·12
Smithfield	—	0·73	17·50
Salisbury.......	0·02	0·64	18·54
Adelaide	0·18	0·74	21·10
Glen Osmond ..	0·31	0·71	25·96
Magill	0·17	0·81	25·50
MOUNT LOFTY RANGES.			
Teatree Gully ..	0·21	0·88	27·30
Stirling West ...	0·37	1·19	46·91
Uraidla	0·45	1·10	43·91
Clarendon	0·12	0·87	32·82
Morphett Vale .	0·10	0·73	22·64
Noarlunga......	0·05	0·70	20·34
Willunga	0·09	0·81	26·01
Aldinga	—	0·71	20·21

RAINFALL—*continued.*

Station.	For Feb., 1933.	Av'ge for Feb.	Av'ge Annual Rain-fall.
MOUNT LOFTY RANGES—*contd.*			
Myponga	—	1·17	29·48
Normanville	—	0·65	20·69
Yankalilla	0·06	0·77	22·85
Mount Pleasant	0·13	0·77	27·18
Birdwood	0·20	0·71	29·15
Gumeracha	0·29	0·83	33·39
Millbrook Res.	0·28	1·15	34·86
Tweedvale	0·26	0·88	35·89
Woodside	0·20	0·90	32·25
Ambleside	0·17	0·88	34·87
Nairne	0·12	0·91	28·09
Mount Barker	0·23	0·94	31·79
Echunga	0·26	0·92	33·15
Macclesfield	0·12	0·90	30·43
Meadows	0·17	0·98	36·12
Strathalbyn	0·03	0·73	19·34
MURRAY FLATS AND VALLEY.			
Meningie	0·11	0·61	18·37
Milang	—	0·58	14·92
Langhorne's Ck.	—	0·62	14·76
Wellington	—	0·58	14·56
Tailem Bend	—	0·80	14·70
Murray Bridge	—	0·58	13·59
Callington	—	0·58	15·20
Mannum	0·03	0·49	11·47
Palmer	0·06	0·68	15·43
Sedan	—	0·54	12·11
Swan Reach	—	0·72	10·60
Blanchetown	—	0·55	11·04
Eudunda	0·03	0·65	17·11
Sutherlands	—	0·51	10·82
Morgan	—	0·56	9·20
Waikerie	—	0·98	9·66
Overland Crnr.	—	0·68	10·41
Loxton	—	1·02	11·59
Renmark	—	0·77	10·49
WEST OF SPENCER'S GULF.			
Eucla	0·07	0·69	9·98
Nullarbor	—	0·47	8·73
Fowler's Bay	—	0·47	11·82
Penong	—	0·71	12·12
Koonibba	—	0·83	11·82
Denial Bay	—	0·58	11·36
Ceduna	—	0·55	9·95
Smoky Bay	—	0·48	10·28
Wirrulla	—	0·28	10·08
Streaky Bay	—	0·47	14·82
Chandada	—	—	—
Minnipa	—	0·73	13·68
Kyancutta	—	—	—
Talia	—	0·41	14·63
Port Elliston	0·03	0·43	16·39
Yeelanna	0·10	0·43	15·72
Cummins	0·02	0·55	17·35
Port Lincoln	0·02	0·50	19·34
Tumby	—	0·53	13·92
Ungarra	0·08	0·66	16·73
Carrow	—	0·69	13·08
Arno Bay	—	0·62	12·44
WEST OF SPENCER'S—*contd.*			
Rudall	—	0·59	12·19
Cleve	0·03	0·64	14·66
Cowell	0·02	0·58	11·10
Miltalie	0·06	0·61	13·54
Darke's Peak	—	0·74	14·92
Kimba	—	0·89	11·52
YORKE PENINSULA.			
Wallaroo	—	0·50	13·91
Kadina	—	0·50	15·61
Moonta	0·02	0·52	15·05
Paskeville	0·01	0·47	15·46
Maitland	—	0·64	19·90
Ardrossan	0·08	0·48	13·93
Port Victoria	0·07	0·49	15·40
Curramulka	0·02	0·51	17·87
Minlaton	—	0·49	17·80
Port Vincent	—	0·61	14·40
Brentwood	—	0·54	15·45
Stansbury	0·05	0·50	16·81
Warooka	—	0·54	17·51
Yorketown	0·02	0·49	16·94
Edithburgh	0·20	0·52	16·34
SOUTH AND SOUTH-EAST.			
Cape Borda	0·06	0·62	24·83
Kingscote	0·01	0·59	19·11
Penneshaw	0·04	0·79	18·85
Victor Harbor	0·03	0·74	21·27
Port Elliot	0·02	0·73	19·91
Goolwa	—	0·70	17·81
Copeville	—	0·76	11·44
Meribah	—	0·76	11·10
Alawoona	—	0·69	10·02
Mindarie	—	0·61	11·91
Sandalwood	—	0·71	13·57
Karoonda	0·02	0·78	14·33
Pinnaroo	0·03	0·97	14·54
Parilla	0·05	0·70	13·90
Lameroo	0·04	0·78	16·08
Parrakie	—	0·74	14·49
Geranium	0·04	0·74	16·41
Peake	0·01	0·85	16·03
Cooke's Plains	—	0·64	15·38
Coomandook	0·11	0·67	17·11
Coonalpyn	0·09	0·61	17·42
Tintinara	0·12	0·79	18·60
Keith	0·02	0·95	17·87
Bordertown	0·01	0·74	19·22
Wolseley	0·06	0·72	18·41
Frances	0·02	0·79	19·99
Naracoorte	0·03	0·75	22·59
Penola	0·04	0·87	26·06
Lucindale	0·05	0·67	23·16
Kingston	0·08	0·70	24·33
Robe	0·09	0·73	24·64
Beachport	—	0·90	26·93
Millicent	0·19	1·03	29·76
Kalangadoo	0·22	1·48	32·03
Mount Gambier	0·20	1·06	30·52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		Mar.	April.
Adelaide	*	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	†	10	7
Alma	*	—	—
Amyton	*	—	—
Angaston	*	—	—
Appila	*	—	—
Appila Yarrowie	†	—	—
Arthurton	*	—	—
Ashbourne	*	8	5
Auburn Women's	†	31	28
Balaklava	*	27	24
Balhannah	†	—	—
Balumbah	*	—	—
Balumbah Women's	†	1	5
Barmera	*	—	—
Beetaloo Valley	†	6	10
Belalie Women's	*	14	11
Belvidere	*	—	—
Berri	*	14	10
Big Swamp	*	—	—
Blackheath	*	16	13
Black Rock	*	—	—
Black Springs	†	—	—
Blackwood	*	R	R
Block E	*	—	—
Blyth	*	24	28
Booleroo Centre	*	10	7
Boolgun	*	—	—
Boor's Plains	970	2	6
Borrika	*	—	—
Bowhill	*	6	10
Brentwood	†	2	6
Brinkley	*	8	5
Brinkworth	969	6	10
Brownlow	†	—	—
Buchanan	†	—	—
Bugle	*	14	11
Bundaleer Springs	*	—	—
Bute	*	16	20
Butler	*	—	—
Calca	*	—	—
Cadell	*	—	—
Caliph	*	7	4
Caltowie	*	—	—
Canowie Belt	*	—	—
Caralue	*	8	5
Carrow	*	8	5
Chandada	*	—	—
Charra	*	—	—
Cherry Gardens	†	11	8
Clanfield	*	—	—
Clare Women's	*	—	—
Clarendon	*	6	10
Cleve	*	11	1
Cobdogla	*	—	—
Collie	*	1	5
Colton	*	—	—
Coomandook	*	23	27
Coonalpyn	*	—	—
Coonawarra	*	9	13
Coonawarra Women's	*	15	19
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	—	—
Cummins	*	10	14
Cungena	*	2	6
Currency Creek	*	13	10
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	—	—
Elbow Hill	*	7	6
Eudunda	*	6	3
Eurelia	*	11	8
Eurelia Women's	*	1	5
Everard East	*	—	—
Farrell's Flat	*	24	28
Finniss	*	—	—
Frances	*	1	5
Frayville	†	—	—
Gawler River	*	—	—
Georgetown	*	11	8
Geranium	*	25	29
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Glossop	*	—	—
Goode	972	15	12
Goode Women's	*	15	12
Greenock	†	13	17
Green Patch	†	9	6
Gulnare	*	—	—
Gumeracha	*	13	10
Halidon	*	—	—
Hanson	*	7	11
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Hawker	*	—	—
Hindmarsh Island	†	—	—
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Kanni	*	—	—
Kapinnie	*	—	—
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Karcultaby	*	—	—
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Koolunga	*	—	—
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Koonunga	*	—	—
Koppio	*	7	4
Kringin	*	13	10
Kulkawirra	*	14	11
Kyancutta	*	7	4
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Kybybolite Women's	*	7	4
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Langhorne's Creek	†	8	5
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Laura Bay	972	14	11
Lenswood & Forest Range.	*	—	—
Light's Pass	970	—	—
Lipson	*	11	8
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Lone Pine	*	6	10
Longwood	*	—	—
Lowbank	*	8	5
Loxton	*	10	14
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Lyndoch	*	7	4
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Maltee	†	9	6
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*** No report received during the month of February. † Held over. R In recess.**

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

WOMEN'S BRANCHES.

McLAREN FLAT.

February 2nd.—Present: 15 members.

QUINCE AND APPLE JELLY.—Paper contributed by Mrs. W. Oakley:—"The fruit in general should be slightly under ripe. For preference, Adams Permain or Five Crown are good apples to choose. First, clean the fruit thoroughly, cut in quarters, leaving the peel and core intact. Put in preserving pan, barely cover with water, and boil for about one hour, or until the fruit is soft; then strain through jelly bag, allowing it to drain over night. Avoid all squeezing, which causes the jelly to be cloudy. Next day measure the juice, and to every cup of liquid add one cup of sugar, and boil for about half an hour, skimming occasionally. Boil rather quickly, but not too long, as it will spoil the color. The juice of a lemon added to apple jelly improves it. Put in glasses while still hot, and cover when cold."

The following recipes were supplied by Mrs. J. Bruce:—*Tomato Sauce.*—Ingredients: 12lbs. tomatoes, 6 large apples, 4ozs. salt, ½oz. cloves, ¼oz. mace, ½oz. whole spice, ½oz. ground ginger, ¼oz. cayenne pepper, ¼lb. garlic, ¼lb. shallots, three pints white vinegar. Method.—Break up or cut up tomatoes and apples; boil all ingredients, tomatoes, and apples together until tender enough to work through sieve. After putting all through, put back into stew pan with the 3 parts of vinegar and boil until thick enough to bottle. *Worcester Sauce.*—Boil 2 quarts of vinegar, and, when cold, add the following:—1 pint mushroom ketchup, 1 pint treacle, ¼ pint soy, ¼oz. cayenne pepper, 1oz. bruised ginger, 1oz. cloves, 1oz. garlic, 1oz. salt. Put all in jar, and stir or shake very often, and after 7 days strain and bottle. *Plum Sauce.*—6lbs. plums, 1 quart vinegar, ½ cup salt, 2lbs. sugar, 1 teaspoon cayenne pepper, 1 tablespoon whole pepper, 1 tablespoon whole ginger, 1 tablespoon cloves, a few pieces of garlic. Any large plum will do. Apricots can be used. Put all into pot, and boil from 2½ to 3 hours; then put through sieve, and bottle. *Mushroom Ketchup.*—Break 1 peck of mushrooms into an earthenware pan, and strew ¼lb. of salt over them. Let stand until next day; then strain off the liquor through muslin, and squeeze the mushrooms through the muslin also. Measure and boil quarter of an hour. To every quart of liquor add 1oz. whole pepper, ¼oz. all spice, ½oz. whole ginger (bruised), and 2 blades mace; boil all together for ½ an hour; strain, and, when cold, bottle and cork. Well dip top of bottles in wax or hot resin. (Secretary, Mrs. C. Robertson.)

PARILLA (Average annual rainfall, 13.90in.).

December.

HOUSEHOLD RECIPES.—Members supplied the following recipes:—*Cauliflower Pickle*: 1 cauliflower (any size), 1lb. onions; cut up overnight (sprinkle with salt); in the morning strain off liquid, then cover with vinegar and boil from 10 to 15 minutes; add 2 or 3 cups sugar and 1 cup of flour, 2 tablespoons mustard, 1 teaspoon tumeric, ¼ teaspoon cayenne mixed to a smooth paste with cold vinegar; boil together for 5 minutes; more or less sugar may be added according to taste. *Coffee Cake*: 2 tablespoons butter, 1 cup sugar, 2 eggs, 1 cup milk, 1 nutmeg, 2 cups S.R. flour; make topping flour and enough butter to crumble, and sprinkle with sugar. *Recipe for Aching Eyes*: Cold tea (without milk) gives relief to bloodshot, aching eyes. Small pads of clean linen should be soaked in the tea and tied very carefully over the eyes. *Murray Cake*: ½lb. good dripping, 1¼ cups sugar, 2 tablespoons golden syrup, 2 teaspoons mixed spice, 2 cups milk with 2 heaped teaspoons carb. soda dissolved in it, 2 cups fruit, flour to make cake mixture—about 1 sifter full; beat sugar and dripping, add syrup, then milk and soda, then fruit, and lastly spice and sifted flour; bake in moderate oven for 45 minutes. *House Soap*: 6lbs. clarified fat, 1lb. caustic soda, ¼lb. resin, 2 tablespoons borax, 2 tablespoons cloudy ammonia, 2galls. water. *Date Sauce*: ½ pint milk, 1 tablespoon dates, 1 dessertspoon cornflour, 2 tablespoons golden syrup, and a little lemon juice. *Hop Beer*: ½ kerosene tin water, 2ozs. hops, 2ozs. bruised ginger, 2lbs.

sugar; boil for ½ hour; take off fire and fill tin with cold water, when lukewarm add 1 cup yeast; stand for 24 hours, then bottle. *"Depression" Cake*: Take 1 cup each of clarified dripping, sugar, currants, sultanas, and hot water; to these add ½ packet spice, ½ teaspoon ginger and lemon peel to taste; put all ingredients into a saucepan and boil for 5 minutes; when mixture has cooled add 2½ cups flour and 1 teaspoon carb. soda dissolved in hot water; mix well and put in a tin with 3 layers of greased paper; bake in moderate oven from 1½ to 2 hours; will keep for weeks in an air-tight tin. *Lemon Filling for Sponge Cake*: 1 cup sugar, 1 cup water; put on in saucepan to boil, then add juice and grated rind of a lemon; mix 2 tablespoons cornflour with a little water and stir into mixture until clear; put between cake while still warm. (Secretary, Mrs. R. Welden.)

RENDELSHAM.

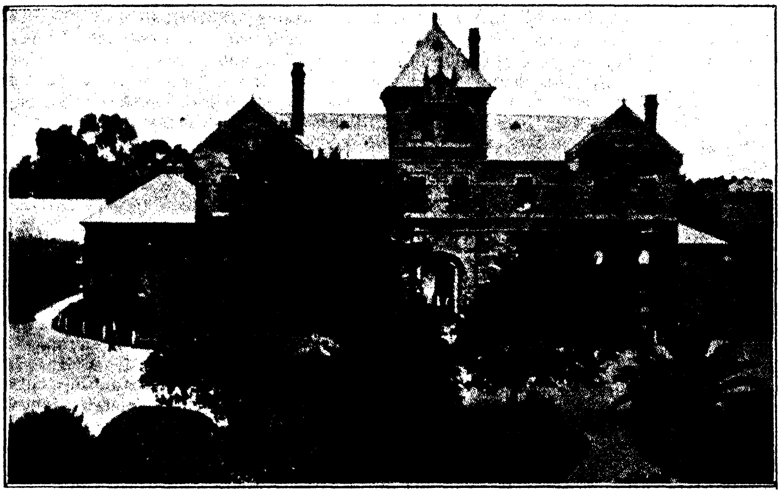
January 11th.—Present: 10 members.

BREAD-MAKING.—Mrs. W. Inns read the following paper:—"Make the yeast in the morning, leaving about ½ cup of yeast in bottle after each mixing. Cut 2 small potatoes into slices, 1 tablespoon loose hops, 1½ pints water. Boil together 5 minutes, strain, and, when cool, stir in 1 tablespoon flour, 1 tablespoon sugar, 1 teaspoon salt. Bottle, and cork loosely. This yeast is ready to mix bread the same evening. *Bread.*—Take 16 cups flour, 1 handful salt, and mix in a deep pan. Make a hole in centre, add 2 cups yeast, and sufficient warm water to make a stiff dough. Knead well, and cover lightly to rise in a warm place. In the morning turn out on floured board, and divide into loaves. Put these into greased tins, and let rise again from 1½ to 2 hours. Bake in a fairly hot oven, and leave open for 10 or 15 minutes before finally closing up to bake. Bake 1 hour or more, according to size of loaves." Many other valuable recipes on yeast making, German cake, and currant loaves were given by members. After a general discussion the meeting was closed. (Secretary, Mrs. E. Andrews.)

WARRAMBOO.

February 3rd.

JAM MAKING AND PRESERVING.—Mrs. Steer read the following paper:—"The fruit should be firm and sound. If over-ripe fruit is made into jam and kept for any length of time it is apt to ferment or develop mould, because there is too much sugar and not enough jelly in the fruit. The sugar acts as a preservative; use the best sugar. The usual proportions are ¾lb. sugar to 1lb. fruit, but, if keeping the jam for any length of time, use pound for pound. The preserving pan should be shallow to allow evaporation to take place freely. If using a deep pan the jam needs longer time cooking. Insufficient cooking is often the cause of failure, and mould on the jam is the result The object in cooking is to evaporate the water in the fruit. If insufficiently cooked, the jellying properties are destroyed, and the color is spoiled. The jam should boil quickly, usually 1 hour after adding the sugar. Cut up the fruit the night before, and put part of sugar on it over night, and when that comes to the boil add remainder of sugar. If making jam more like a preserve, pour off the juice, boil, then add the fruit. It is a good plan to put marbles or a couple of two shilling pieces in the bottom of the pan before adding the fruit and sugar; it will help to prevent the jam from catching, and stirring is not required so constantly. *An Acid Hint.*—When apples or quinces are tasteless, add tartaric acid to the fruit. Use ½ teaspoon to 10lbs. of fruit for jam, and a pinch when making pies. *Whole Fruit Jam.*—For berries of any kind butter the bottom of the pan. Leave fruit in over night, with 1lb. sugar. Do not stir, and put the rest of sugar in by degrees when boiling. Apricots cut in halves and melons in dice cooked this way is an improvement on stirred jam. Bottle jam when warm, cover and label, and store in a cool place. To cover jam, dip tissue paper in milk, and press down carefully. When dry it is stiff like parchment, and will keep for 12 months. *Preserving Fruit.*—For screw-top jars, the fruit should be firm, not too ripe, and of one size, if possible. If fruit has to be peeled, drop it into cold water to prevent discoloration. The bottles should be thoroughly sterilised, and rubber rings and caps should fit tightly. Rubber rings should only be used once. Sealing can be adopted if one has not the patent self-sealing bottles. Use ¼lb. of paraffin wax at a time; melt it, and keep it ready on hot water. When the bottle is filled pour a thin layer of the melted wax on top, fit down the cap, or cork tightly, and stand in the steriliser. Be careful not to jerk the bottle. When sterilising is finished remove the bottle, push in the cork or cap down firmly, and coat the outside with melted wax. Put the bottle away while still warm. This is important, otherwise the inner layer of wax may crack. *The Syrup.*—To every quart of water allow ½lb. best white sugar, bring to the boil, and boil for half an hour, skimming when necessary. Cool before using. *To Bottle.*—Pack the fruit tightly into the sterilised bottles, and make as attractive as possible. Fill up with cold syrup. Dip rubber rings into hot water, and fasten securely on bottles. If wished, water may be used in place of syrup. *To sterilise.*—Place bottles in a steriliser. A preserving pan or kerosene tin will do, provided plenty of packing is placed in the bottom and around the bottles. Add



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sufficient water to come two-thirds of the way up the bottles. Bring slowly to the boil, or 160 degrees F. The water should take at least 1 hour to reach 160 degrees. If heated too quickly, the skins on the fruit break. Take from steriliser, tighten the caps, and turn upside down to test for leaks. If leaking, re-sterilise next day. Wipe the bottles, label, and store in cool place. *Time Allowed for Cooking.*—Plums, 25 minutes; rhubarb, 20 minutes; apricots and peaches, 45 minutes; pears, 1 hour; berries, 30 minutes. *To Bottle Tomatoes.*—Small tomatoes are the best to use. Pack tightly in sterilised bottles, and cover with water. Put in steriliser, bring slowly to 170 degrees, or boil. Take out; leave 24 hours. Repeat next day; leave 2 or 3 days, and sterilise again. Tomatoes done this way will keep indefinitely. (Secretary, Mrs. A. Collins.)

WASLEYS.

February 2nd.

Mrs. L. W. George contributed a paper, "Pickles, Chutney, and Sauce." Members brought along the following tomato recipes:—*Breakfast Dish* (Mrs. M. Richter).—Fry tomatoes in butter, put on toast, pour cream into pan after removing tomatoes, stir, and pour over tomatoes on toast. *Tomato and Apple Chutney* (Miss Sires).—Cut up 2lbs. apples, 2lbs. tomatoes, 1lb. onions, 1 teaspoon each of whole spice, cloves, and pepper, 2 teaspoons ground ginger, 1 tablespoon salt, 1 cup brown sugar. Cover with 1 bottle vinegar. Boil gently 3 hours. *Onion Pickles* (Mrs. C. Marshall).—12lbs. onions, cover with boiling water, and a large handful of salt, leave standing till next day. Strain, cover with more boiling water and salt. Next boil enough vinegar to cover 1 teaspoon pepper corns and ½ teaspoon mustard seed, 3 or 4lbs. sugar. *Tomato Salad* (Mrs. Howlett).—Slice tomatoes, and make the dressing as follows:—1 cup cream, 2 tablespoons Worcester sauce, 3 tablespoons vinegar, 1 tablespoon sugar (or more, to taste), a little salt. *Tomato Ketchup.*—Cut up 4lbs. tomatoes and 1lb. onions. Put in stew pan with 4oz. salt, 1lb. brown sugar, 1 saltspoon cayenne, 2oz. pepper corns, 12 cloves, ¼lb. allspice, 1 pint best vinegar. Bring slowly to boil, and simmer for 1 hour. Stir, to prevent sticking. Rub through a sieve while hot, then bottle. *Tomato Chutney* (Miss Allen).—3lbs. ripe tomatoes (skinned), 3lbs. apples, 1 dry onion, 1lb. brown sugar, and a piece or two of garlic, 1 dessertspoon pepper, 1 dessertspoon salt, 1 oz. ground ginger, a few currants and cloves. Cover whole with vinegar, and simmer 2 hours. *Tomato Omelette* (Mrs. Wilson).—Make a batter with 1 egg, ½ cup flour (self-raising), 1 cup or more of milk, a batter about the consistency of thick cream. Add slices of tomato, pepper and salt, and, if liked, some finely chopped onion. Pour in dessertspoonful into boiling fat. Turn, and, when a golden brown, dish up. Not too much fat needed. (Secretary, Miss G. George.)

CONFERENCE AT AUBURN.

A very fine attendance of delegates from Branches at Auburn, Saddleworth, Wirrilla, Clare, and Williamstown attended the special sessions for women held at the Lower North Conference, at Auburn, on February 23rd.

Mrs. J. S. Hammatt, of Williamstown Branch, presided. Miss E. Campbell (Inspector of Domestic Arts, Education Department) delivered an address, "Wool and Its Uses," and the following papers were read and discussed:—

"CARE OF CREAM AND MAKING OF BUTTER."

[By Mrs. L. H. Giles, Auburn.]

Butter is of great value as a food, and should be consumed more; it is rich in vitamins and is easily digested. Children, especially, should be encouraged to eat plenty of butter; it is a very necessary and helpful food for the development and growth of the body. If economy in housekeeping must be practised where there are children, it is better to economise in something else, but allow a generous supply of butter on the table.

To produce good butter, the cows must be fed correctly. Care must be taken that they do not eat any weeds or food that may taint the milk. All utensils in the dairy must be kept perfectly clean, and after they are washed should be rinsed in boiling water. Allow cream from the separator to cool before mixing with other cream, and when mixed, stir twice a day, and keep in a cool place. To ensure best results, cream should not be kept more than two days before churning in summer, and four days in winter.

Cream to be churned should be about 60 degrees in temperature. If this temperature is obtained, and if the cream is fairly thick, the butter will be churned in a few minutes without any trouble. Once churning has commenced it should be continued until the butter has become a solid lump, then the buttermilk should be immediately strained off, and the butter removed to a shallow dish, which will be found easier for washing purposes.

It is important that all buttermilk be thoroughly washed out of the butter. A scalded wooden pat should be used to stir the butter about in the cold water. The water is then poured off and some clean water added. This process is continued until the water comes away clear. Sometimes it is essential to change the water five or six times before it becomes clean.

Butter will not keep good for long if any buttermilk is left in it. After washing, all water should be worked out of the butter with wooden pats which have been scalded. When free from moisture, the butter is weighed and salted, allowing about a teaspoonful of salt to each pound of butter.

Care should be taken that the salt is fine with no lumps in it, and it must be worked well into the butter. If this is not done the butter will have a streaky appearance when cut. It is easiest to work the salt into small quantities of not more than 6lbs. at a time. The butter should then be weighed and patted into shape on a board that has been scalded. It is advisable to allow 1oz. overweight, as sometimes butter loses weight after a few days, owing to the evaporation of the moisture that has been allowed to remain in it.

When the pound of butter is in shape lay the paper on it and fold over sides, turn with pats, and neatly fold in edges. Butter made in this way will keep in good condition for a fortnight.

POULTRY.

[By Mrs. W. H. McKendrick, Clare.]

Poultry farming requires courage, determination, and brains. In poultry farming, one must be alert, study, and be attentive to detect the little things that count. Fowls are subject to many ills, and attention given quickly very often saves heavy losses.

Housing of poultry is most important. The house should be so fixed that the sun can shine into it during the day, and it should be watertight and free from cracks that would cause draughts, which are injurious to fowls.

In mating for egg production, select birds with good, sound bodies, lean heads, and full, bright eyes. Reject all birds that are not up to standard. The head and eyes play a very prominent part in selecting, for the female with bold, full, bright eyes is always a layer. In selecting the male bird be positively certain that he comes from sound, healthy stock of the highest standard; see that he is free from blemishes and true to his particular breed. Remember that the male bird plays the more important part in the breeding pen.

Hatch in August, September, and October for egg production. This applies to light breeds only; heavy breeds require to be hatched one month earlier. Second season hens mated with a well-grown, vigorous cockerel make the best breeders

Do not overcrowd the layers. Birds penned in lots of 10 to 15 do much better than lots of 50 to 100. Watch the breeding hens and see that they are in perfect health; and that the male bird is also kept free from vermin. Keep the breeders fit by having plenty of straw in the pens for scratching purposes. Throw the grain into the litter and make the birds work for their food.

Do not neglect feeding. Give plenty of green feed in the morning mash, and again at midday. The evening meal should consist of good, sound grain.

Morning Mash.—Put meat meal into mixing tub, pour boiling water over meal and stir well, then add green feed which has been finely cut, then bran, and mix well; lastly, add pollard. It is a good plan to chop up onions and put in the mash, also put Glauber salts in the mash once a week. See that there is always a plentiful supply of shell grit and charcoal in the pens. Also plenty of cool, clean water.

For incubation a reliable incubator is necessary, one which, with reasonable care and attention, will not show much variation in temperature. Always give every machine a trial run of 24 hours before placing eggs in incubator. All eggs should not be less than 2ozs. Badly shaped eggs—also those of porous shell—should be discarded. Use eggs as fresh as possible. Eggs that are being kept for incubation should be turned twice a day and covered with a blanket, and kept in a cool, dry place. Start with a thermometer temperature of 102 degrees for the first week, and allow an increase to 104 degrees by the end of the third week. Close down the incubator on the nineteenth day, and on no account open it again until the twenty-second day. The hatch will then be complete. Give incubators a good cleaning out after each hatch. New incubators benefit by a coat of varnish before use.

Chickens should not be removed from incubator until 24 hours after hatching. See that clean water is available in the brooder, and add a small quantity of Epsom salts to the first drinking water. There should also be a supply of fine shell grit and charcoal spread on a board until they learn to pick. Do not give any food for 50 hours after hatching. Give chickens a good chick grain mixture for the first 10 days, then a growing mash and plenty of greenfeed. Sand and chaff make a very good floor covering for brooders. Cleanliness of brooders must on no account be overlooked.

To Fatten Cockerels.—A little beef or mutton dripping in the mash, or even bacon fat is splendid. Another method is to buy pieces of fat meat from a butcher and "render" them down in an old tin on a slow fire. When the melted fat has cooled, cut it into small pieces to put into the mash.

It is a pity more women do not take up poultry, and get out of doors more. There is more in poultry farming than merely throwing some feed to fowls, gathering up eggs, and receiving cheques. Fowls should be fed reasonably early and at regular intervals. Study the birds and use plenty of common sense mixed with good food. The result will be a pleasing one.

BREAD, ETC.

[By Mrs. PYCROFT, Clare.]

YEAST.

To make good yeast good potatoes are required, and good flour to make good bread. If a bag of flour is on hand, obtain another and mix them together; this is a great improvement. Never throw away water in which potatoes have been boiled. It is very useful, and can be added when making yeast or when mixing bread.

Hop Yeast.—Boil 3 medium sized potatoes in 2 pints of water. When nearly done add 2ozs. hops, boil 20 minutes longer, then mash and strain, adding 1 tablespoon flour and 2 tablespoons of sugar, stir well, put in a jar or bottle, cover, and allow it to stand in a warm place for three days, when it will be ready for use.

To Set the Sponge.—Wash and peel 3 medium sized potatoes and boil in enough water to cover them well. When soft, mash well in water and then add 1 cup of sugar, ¾ cup flour, ½ teaspoon of tartaric acid. Allow this to cool, and when luke warm add 2 cups of hop yeast. Mix well (keep back 2 cups of this mixture for the next baking). This is acid yeast, and must be kept in a warm place, and added next time when making a fresh mixture for sponge instead of hop yeast. In this way one can bake five or six weeks, even without hop yeast, and then start fresh again. To the above mixture add enough flour to make a nice sponge, so that it runs off the spoon, beat well, cover, and put in a warm place to rise. This may be done either first thing in the morning or last thing at night.

To Set the Dough.—For the quantity sift 6lbs. or 7lbs. of flour, add ¼ cup of salt, about 6 pints of luke warm water—or half water and half milk may be used. Make a hole in the middle of the flour, pour in the sponge and water gradually and mix into a flexible dough, cover, and set in a warm place to rise for 2 or 3 hours. Then shape into loaves, using as little flour as possible; place in greased tins and let the dough rise again in a warm place for another hour, then bake. The oven should be hot and a regular heat maintained for some time.

Note.—Salt checks fermentation and *must not* be added with the yeast. It *must* be added with the *flour*, never with the yeast itself. Sugar assists fermentation.

YEAST OR GERMAN CAKE.

Ingredients.—12 cups flour, 2 cups sugar, 1 cup cream (if no cream on hand, half butter and half lard—or 1 cup lard only will do). Without butter or cream a few more eggs may be added—6 or 8. A teaspoon of ground mace, essence of lemon or vanilla, a few sultanas or currants, about 2 cups of milk and 2 tablespoons of salt. *Topping.*—3 cups of flour, 2 cups of sugar, essence of lemon or vanilla, cinnamon, if liked, enough butter to make it crumbly, and put on cake and bake.

SPONGE.

Make a sponge the same way as for bread, only about half the quantity for this recipe of cake. *To make the dough.*—Sift the flour, warm milk, melt butter or lard, beat eggs and sugar with a little warm milk, make a hole in the flour, put in all the ingredients, mix with a little warm milk and flour, lastly put in the sponge with some more warm milk, and put in a warm place to rise for about three hours. Then put in well-greased slides, about an inch thick, using as little flour as possible, put in a warm place to rise for another hour, then brush over with some melted butter or thin cream, and put on the topping and bake 20 minutes to half hour. The flour should always be warmed in cold weather.

If the hop yeast is not all used, a little may be added each time until all is used.

COOKING AND SERVING MEATS.

[By Mrs. A. WILSON, Wasleys.]

The tastiness of meat dishes depends very much more on the cooking than is perhaps realised. A tough and tasteless dish is often said to be the fault of the butcher, when it is really faulty cooking. To cook corn beef put the joint on in cold water, throw in a nutmeg, a very small pinch of carbonate of soda, and a splash of vinegar. Bring to boil and keep boiling about 40 minutes. I then push it to one side of stove, where it *simmers* for 4 hours. Corned mutton I cook in the same way for 3 hours—1 hour to come to the boil and reach the simmering stage. Corn pork is cooked in much the same way as corned beef. Directly the pork is taken from the saucepan the skin is removed, and browned bread crumbs sprinkled thickly over with grated nutmeg shaken over the crumbs.

Roasts of beef and mutton are put into hot oven after the joints have been rubbed with flour and placed in dish containing fat. After 30 minutes the heat of oven is reduced and the joints cooked slowly for 3 to 4 hours. An onion roasted in with the meat ensures a good flavor and rich gravy.

Lamb and veal are better roasted and served with mint sauce and lemon juice.

Chops retain their juiciness and flavor best if rolled in egg and breadcrumbs, then fried in deep fat. When crumb frying, make the gravy with freshly made tea out of the teapot instead of water. Plain fried chops should be put into a very hot pan with very little fat and turned at least four times.

Steak should be fried in the same way. Gravy beef is best for stews and beef steak puddings. For stews, partly fry the steak, also onions and carrots, then put into saucepan, cover with water, and simmer 2 to 3 hours. Thicken with flour before serving.

Beef Steak Pudding.—Line a mould with a light dripping or suet pastry, cut up raw steak into small dice, roll in flour, put into basin with salt, pepper, onions, and cover with cold water. Cover quickly with paste, tie down and put straight into saucepan of boiling water to steam for 4 to 5 hours.

Chops can be put into piedish, add cut up onion, cover with cold water, put a cover over and cook for 2 hours. Then cover with a paste of 1 tablespoon dripping, 1 egg, 1 cup flour, ¼ cup milk, and cook 30 minutes.

To make curry use cooked meat cut into dice. Put 1 tablespoon butter in pan to heat, add cut up onion, lightly fry, then add cut up meat, 1 tablespoon flour, 1 large teaspoon curry powder, and 1 apple and 1 teaspoon plum jam if liked. Fry all for 10 minutes, pour over enough hot water to cover, then put all in saucepan to simmer 1 hour or more. Serve with boiled rice and chipped potatoes.

Lamb's fry should be washed in salt water, well drained, rolled in flour, and slices cooked in boiling fat and served with fried rashers of bacon.

Brains should be soaked in salt water. Remove skins and boil gently for 40 minutes. Can be boiled again in milk then thickened with flour, salt, pepper, and a little butter, or can be dipped in batter and fried. Sausages should be rolled in flour and well cooked, or rolled in egg and bread crumbs and fried.

USES OF EGGS.

[By Miss Dennison, Auburn.]

In these days of depression one needs to study economy in the home. Housewives should turn their attention to using more eggs. There is a different way of using eggs for every day in the year. No other food product will do this so nourishingly and so well. The main thing is to see that the eggs are fresh. This can be tested in several ways. Hold the egg before a lighted candle or to a strong artificial light. If an egg looks clear it will be perfectly good, but if there is a dark spot attached to the shell it is worthless. Stale eggs are considerably lighter than those newly laid. Most housewives nowadays keep a few fowls, and can produce enough eggs for their own use in the home. By keeping the eggs gathered often she should have no difficulty in having fresh eggs.

Recipes.

Bacon and Egg Pie.—Mince or cut fine ¼lb. uncooked lean bacon or ham and pour boiling water over to extract salt. Line a piedish with good short pastry and sprinkle in the bacon. Mix 4 eggs with a large cup of milk and a little pepper, pour over the bacon and bake in a moderate oven. Can be heated for eating at any time, and is nice with tomato sauce.

Coddled Egg.—Have the saucepan of water boiling and put in the egg, cover closely, and remove from boiling point. Allow to stay in water 5 minutes. This is the best way to cook an egg for a child or an invalid, it is easily digested.

Steamed Egg.—Butter a cup, sprinkle with finely chopped parsley. Break in egg, stand in boiling water till set, turn out on buttered toast.

Puffy Omelette.—Three eggs, 1 teaspoonful chopped parsley, 2 tablespoons milk or cream, tiny piece finely chopped onion, salt. Beat whites and yolks separately—that makes omelette puffy. To well beaten yolks add other ingredients. Fold in stiffly beaten whites, pour into hot well-buttered pan, cook a few minutes, then put under grills to set top lightly; serve hot. Cheese may be used instead of parsley. Three eggs make enough to serve two persons generously.

Eggs have many uses. For mustard poultices—white of egg used instead of water in mixing mustard poultices prevents the skin from blistering. A little white of egg spread promptly over a burn eases the pain and prevents the formation of blisters. A shampoo makes the hair beautifully clean and fluffy. Beat the white of an egg stiff and rub lightly into the hair, then push all the waves carefully back into place, leave all night; in the morning brush out the fine white powder that was egg white. Leather which has become shabby looking and dull can be improved in appearance if rubbed over with the well-beaten white of an egg. For gluing down jam, use the white of an egg.

White Embrocation.—To make a good embrocation for sprains and rheumatic pain, put ½ cup each of turpentine and vinegar into a bottle and shake well to mix, then add level teaspoon of dry mustard, break into it a fresh egg, and shake till it looks like cream.

Linament for Neuritis.—Take ½ pint of white vinegar, ½ pint turpentine, ¼ pint methylated spirits, 2 cakes of camphor, ½oz. opodeldoc, yolks of two eggs. Dissolve the camphor in spirits, beat the yolks well, add other ingredients. This will keep for years; should be put in small bottles for use.

WOOL DOWNS AND WOOL MATTRESSES.

[By Mrs. Timcke.]

While wool is still bringing such a low price, it pays to find as many ways as possible to which it can be used on the farm. Where sheep are killed at the homestead there are to be obtained sheepskins whose market value is worth only a few shillings, and yet carry several pounds of wool. Now is the time to make articles for the home, which mean comfort and warmth during cold, wintry nights, by replenishing the household stock of bedding, which will last for years, in the form of wool downs and wool mattresses.

Preparing the Wool.

Choose a skin with plenty of wool—for a wool down, Merino or lamb's wool is the best; for a mattress any wool will do. The next step is to wash the wool—the easiest method is to cut the skin into strips, as it is easiest to handle in that way and the wool does not mat so much, it is not too heavy to handle, and is easier and quicker to tease. After washing day, while there is plenty of hot water, put into copper of hot soap-suds and steep well, then rinse and hang strips up to dry. Repeat on two next washing days, when the wool should be clean and free from grease. When clean and dry comb the wool which is still on the strips of skin to tease it, then shear off the wool. The wool is now ready to be used and already teased.

Wool Downs.

To make a wool down cover for the bed, 8yds, of 31in. sateen will be needed, 4yds. for each side. If bands of contrasting plain and figured sateen are preferred, as in shop-bought quilts, 7¼yds. figured and 1¾yds. plain sateen are required.

1. Cut two lengths of figured sateen, each 2yds. long, and join for back of quilt—size of quilt being 72in. x 62in.
2. Cut another 2yds. length of figured into four strips, each 2yds. long by 7¾in. wide, have two strips 72in. long and two strips 62in.—join, mitring corners to make top of quilt 72in. x 62in.
3. Divide plain sateen into four strips 7¾in. wide and join to inside edge of figured strips, mitring corners.
4. Take rest of figured material (about 1¼yds.) and join to inside edge of plain sateen strips for the centre panel (about 42in. x 31in.), thus completing top of quilt.
5. Join edges of front and back of quilt together, leaving unstitched an opening in the middle of ends and sides to allow for stuffing quilt. Turn quilt right side out, pin or tack down along seams of panels, and also chalk design on centre panel and pin or tack that down, then machine along tacking, taking care to leave openings opposite openings on outside edges to allow for stuffing.
6. Stuff quilt with teased wool evenly, stitch up openings, make eyelets in centre panel for ventilation, and the quilt is finished.

A quilt this size takes 3lbs. teased wool. It is light, warm, and pretty, also very durable and much better than a Java down quilt, which soon powders away, also much healthier.

Wool Mattresses.

To make a 3ft. mattress about 18lbs. to 24lbs. of teased wool are needed. If a mattress with built-up sides is made 24lbs. are required, while bedding (pillow shape) takes 18lbs. A good ticking is advisable, so that the wool will not work through, and as the wool will last indefinitely, it pays to get a long-wearing ticking. Measure size of bed and allow 2in. for every foot in length and width, *i.e.*, 3ft. wide needed 3ft. 6in.

material, to allow for taking up in stuffing. For bedding, machine two pieces of ticking together, leaving opening each end for stuffing. Place material on flat surface, stuffing firmly and evenly, sew up openings. Mark places for tabbing on top and underneath surface of bedding. Use leather tabs and mattress twine, and stab with mattress needle, tying leather tabs down firmly.

The mattress made is comfortable and firm, and infinitely more healthy than flock, and much better than kapoc, which is imported and powders away in about six years, and which then makes so much fluff in the bedroom, and must be injurious and likely to cause catarrh.

If a mattress is preferred to the bedding, cut strips of ticking 4in. wide for sides and ends, and pipe edges. Stuff and tab in same way, and stab with needle and twine on side and end strips to hold stuffing to sides to give firm edge to mattress. Allow 6lbs. to 8lbs. of wool (teased) for every foot in width of bed.

HOUSEHOLD HINTS.

[By Mrs. P. Quirke and Miss J. Roach, Clare.]

When making tea, if just a little water—enough to steep the leaves—is added, it will be found that not only a stronger cup is made, but a better one when the rest of the boiling water is added.

Instead of using bi-carbonate of soda—which destroys vitamins—when cooking green vegetables, add a pinch of borax when the water is boiling, vegetables will retain color as well as vitamin content.

If making a Yorkshire pudding, it will be much lighter if made an hour or two before cooking.

Place a little salt in frying pan before frying eggs and it will stop the fat from spitting, and will also help to keep the stove clean.

To lengthen the life of a tin kettle, turn it upside down each night after use.

To remove dry paint from window panes if spilt when painting, rub gently with a penny.

To clean grease or oil off silk stockings, use a little eucalyptus on a cloth and rub gently.

When a heel of a sock or stocking has to be darned, if a tiny tuck is taken under the foot where it will not be uncomfortable in wearing, the darned heel will not show.

PARAFIELD POULTRY STATION.

NOW BOOKING ORDERS FOR SUMMER, 1933.

EGGS FOR HATCHING AND DAY OLD CHICKENS

WHITE LEGHORNS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

BLACK MINORCAS.

EGGS.—10s. per Setting of 15 Eggs; Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £5 per 100.

Free on Rail, Salisbury.

DELIVERY.—CHICKS—February and Early March.
EGGS—January and February.

Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

A good cleaner for windows, place a dessertspoonful of whiting in the water and wash in usual way.

To make a good mop oil, take 1 part boiled linseed oil and 3 parts kerosene and 1 tablespoon of vinegar, mix well.

To make a good floor polish—1½ozs. shellac, 1½ozs. resin, 1 bottle methylated spirits, mix all together and bottle. Ready to brush on linoleums in a day or two.

When covering wooden coat hangers, cut off an inch or so at each end, because they are often too long for average frocks—it saves the ugly mark at the top of the sleeve. The end of the hanger should come only to the end of the shoulder seam.

If woollen stockings are inclined to shrink when washed, peg on the line by the heel and toe.

Before undertaking dirty work, such as cleaning a stove, rub hands—especially around the nails—with soap or vaseline.

A recipe for soft soap.—2lbs. No. 2 soap, ¼lb. borax, ½ kerosene tin water, bring to a boil and add borax when water is fairly hot.

If sugar grains are rather coarse, much time will be saved when making cakes, &c., if the sugar is placed in a flat dish and pressed over thoroughly with a flat iron.

To keep ants away: Bring to a boil 1 cup sugar, 1 cup water, and 1 tablespoon borax. The ants will swarm around it the first day, but the next day will disappear.

Add a little vinegar to wash-up water to remove quickly the smell of fish or onions.

A cloth dipped in turpentine will clean the rubbers on a wringer.

A lettuce that has withered can be made crisp again by placing it in a bowl of water with a steel knife.

To cool an oven: Put a large basin of cold water into an over-hot oven and it will quickly cool it.

To test an oven: To test an oven, take a sheet of white paper and if it only just tinges—becomes a pale straw color—it is fit for sponge cakes, or anything requiring a slow oven.

To cure hiccoughs: Take 1 teaspoon of common vinegar.

To prevent cakes becoming stale, put a thick slice of bread in the crock or tin in which cakes are kept, and renew it every third day.

Iodine stains will disappear by the morning if the article is left in water into which has been stirred common mustard. Repeat the process if the stain is an old one.

To remove rust stains from white goods, rub with juice of lemon and salt, place article out in sunlight. If the rust has not disappeared, repeat. It may be necessary to rinse out the lemon and salt between each application. This method is much cheaper than salts of lemon and quite as effective.

After starch is made, stir with a candle or add white wax to prevent starch sticking to the iron. It also adds a gloss to the clothes.

To remove fruit stains from white or colored cotton goods, stretch articles tightly across a basin and pour boiling water through. If done before the article goes to the laundry, the stain will quite disappear, but if soap has been applied before trying the above method, the boiling water will not have the desired effect.

Mildew on leather: Rub well with vaseline and leave for some time.

Grass stains: Damp the place at once with cold water, then apply cream of tartar.

Grease: Before washing garments on which there are grease marks, rub the spots with glycerine and they will come out with soap and water.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Rendelsham....	7/12/32	10	Question Box	Mrs. G. Andrews
Parilla	18/1/33	16	"Ice cream making"—Mrs. Phillis	Mrs. R. Welden
Balumbah	1/2/33	8	"Home Nursing"—Mrs. Heythuysen	Miss C. Riches
Tantanoola	1/2/33	12	Question Box	Mrs. E. Telfer
Auburn........	27/1/33	14	"Use of Eggs"—Miss Dennison	Miss Dennison
Penola	1/2/33	18	Address—H. H. Orchard	Mrs. E. Kidman
Williamstown ..	1/2/33	6	Discussion	Mrs. A. Cundy
Gladstone......	10/2/33	28	Dress Cutting—M. Rutha	Mrs. M. Sargent
Kangarilla	16/2/33	9	Discussion	Mrs. M. Steer
Kalangadoo ...	11/2/33	11	Demonstrations—Mesdames Messenger and Davies	Mrs. E. Dowdell

MEN'S BRANCHES.

SOUTH-EASTERN.

MOUNT GAMBIER (Average annual rainfall, 30.52in.).

January 13th.—Present: 12 members.

MARKETING GRAIN.—Mr. G. Morris gave the following address:—"*Wheat.*—This is not a profitable crop in this district, because the climate is not suitable for producing the best milling grain. Millers complain that the grain is too soft and unsuitable for their requirements. Oats grown in this district are generally acknowledged as superior for milling purposes to any produced in other parts of the State, but this cannot be said of the oats grown for seed purposes in the district of late years. Nothing but the most carefully selected seed should be sown. Only by grading can foreign matter be successfully avoided. The presence of foreign matter in samples appears to have been the biggest drawback in this line. *Barley.*—Exporters of barley have the whole world to compete with, and growers must realise that quality gets the high prices, and nothing will induce a buyer to pay a penny more for a sample than what it is worth. Therefore, as with the case of oats, particular attention must be paid to the selection and grading of seed. Barley should not be sown too heavily, and I recommend that 1bush. per acre of seed be sown in drills running both ways, *i.e.*, say, ½bush. be sown each way, or failing this, if the ground is clean, that it be scarified at right angles to the drills. This would broadcast the seed evenly and give the plants a chance to stool out. The rate of sowing and method should, under ordinary circumstances, produce a crop of equal quantity, but of a much better quality than that of a heavier sowing. Another point is that seeding be done earlier than it is at present, and I would suggest that same be completed the second week in July. In nine cases out of 10 the grain produced from the earlier sowing is far superior to that from the later sowing. Harvesting cannot be commenced until the crop has ripened thoroughly if the best results are to be obtained, as it is only in the ripening stages that the malting qualities are produced. Unripeness leads to uneven germination and inferior malting qualities. It is noticeable that growers are harvesting their barley this year before it is ripe, with the result that the sample is not a good one, as it would be if the crop were allowed to stand a few days longer. Maltsters look for a mellow grain for their extract, and they cannot get results from a flinty grain which is very often the result of premature harvesting. Great care must be taken in not skinning the grain—this is useless for malting purposes. Bags are also an item which must be given careful attention in the marketing of the grain, buyers are usually very particular that only the best sacks be used, and a grower who uses inferior bags cannot expect to get the same price for his grain as the one who uses good bags, even if their produce is of an equal quality. More especially are good sacks required if the grain is to be shipped overseas. Duckbill is generally recognised as the best variety for this district, as Prior barley sown has so far failed to give good results. A new variety in Plumage was introduced into the district in 1930. I would strongly recommend that this variety be grown more extensively in future, as it is being eagerly sought after by overseas buyers." (Secretary, G. Gurry.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Kybybolite	7/2/33	29	Address—L. J. Cook	A. Shepherd
Mundalla	9/2/33	30	Address—Dr. Davies	A. Ross
Allandale East .	10/2/33	9	Discussion	T. Earl
Mt. Gambier ...	10/2/33	16	"Tree-planting"—W. Robinson	G. Gurry

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WEPOWIE (Average annual rainfall, 12.30in.).

October 31st.—Present: 11 members.

TOUR OF THE DISTRICT.—Some fine crops were seen, and in general they were reasonably free from disease; several plots were affected with rust. Barley grass did considerable damage, in some instances causing a thinning out of the crop. Hay-die in the form of take-all was also seen chiefly in Nabawa, but a plot of Canberra on Mr. W. Roocke's property was severely menaced by this disease. The properties inspected were those of Messrs. D. Crocker, E. Paech, L. Jasper, W. G. Gregurke, J. F. Burns, T. F. Orrock, J. Crocker, C. H. Roocke, and W. Roocke. The general view was that a crop of Waratah on Mr. C. H. Roocke's property was the best inspected on the tour. At this homestead Mr. A. Browne's Clydesdale stallion, "Wiedgewa King," and brood mares were inspected; also a patented thresher attached to a header which has completed a very satisfactory season's reaping, and was highly recommended by the owners. Mr. Orchard addressed the meeting held in the evening.

Harvest Reports were given at the meeting held on February 1st:—Mr. T. Orrock, early April sown Felix, slightly frosted and rusted, 15bush.; Nabawa, rust bad, 18bush.; Ranee, 27bush.; Noongaar, 10bush.; on stubble Nabawa yielded 16½bush.; farm average, 22½bush. Mr. C. Knauerhase: On fallow Ranee yielded 23bush.; Teagle, 21bush.; Nabawa, 19bush.; Currawa, 16bush.; farm average, 20bush. Mr. W. Roocke: Fallow results—Ranee, 27bush.; Sultan, 22bush.; Nabawa, 18bush.; Joffre, 11bush.; Waratah, 10bush; Canberra, 6bush. On stubble—Sultan, 15bush.; Nabawa, 12bush.; Joffre, 12bush. Mr. J. Burns had Ranee and Nabawa in two separate fields, both yielding 21bush. In another field Ranee and Nabawa gave yields of 21bush. and 11bush. respectively, take-all being very prevalent in the latter variety in this field; farm average, 15bush. Mr. H. Roocke also commenced seeding early in April, and Sultan sown first on red soil yielded 18bush., red rust very prevalent; Joffre on a 2-year fallow, 27bush.; on fallow, 21bush; Golden Return, 23bush.; Nabawa, 30bush; Gallipoli, 28½bush.; Waratah, 27bush.; Ranee, 27bush.; stubble sown Ranee yielded 16bush.; farm average, 23bush. Mr. L. Jasper reported that 45lbs. of seed with 1 bag of super sown on the Walloway Plain returned on fallowed ground 18bush.; varieties were, Joffre, Nabawa, and Ranee. The same yielded 14bush. on stubble. At home he reported the following yields:—Ranee, 20bush.; Nabawa, 15bush.; Canberra, 18bush.; Quality, 25bush.; fallow average of 18bush. Stubble is expected to yield 15bush. Mr. E. Roocke reported that Nabawa again proved the best yielder on limestone soil, 35bush.; on mallee soil Nabawa yielded 32bush.; Ranee, 33bush; Canberra, 33bush.; Waratah ripened rather quickly and did not yield to expectations, being considered the best crop inspected on the tour; yield, 28bush; Joffre slightly pinched due to premature ripening, 27bush., giving a fallow average of 30 bush. A field sown to Nabawa and Joffre on stubble ground yielded 9bush. It was sown the first week in April, started well, but thinned out due to the consolidation of the soil; farm average, 25bush. (Secretary, E. Roocke.)

WILMINGTON (Average annual rainfall, 17.43in.).

February 14th.—Present: 14 members.

Harvest Reports.—Crops in the district were good, but did not yield as well as those of last year owing to the ravages of disease. The season was a good one for wheat generally, but humid conditions towards the latter part of the season caused rust to be present in some crops. Of the diseases, rust, take-all, and hay-die were very bad, causing a vast amount of damage to crops. Fallow land produced crops ranging from 10bush. to 27bush., stubble land being almost a failure, the bulk of which averaged about 3bush. to the acre; small areas yielded up to 12bush. As with the previous season, little super was used; where applied only small quantities, about 40lbs. to 50lbs. to the acre, were sown. Unmanured crops yielded well. The most favored wheats were Ranee and Nabawa, both yielded well, and the grain was of excellent sample. Other wheats grown were:—Early and Late Gluyas, Hard Federation, Sultan, Canberra, Onas, Gallipoli, Joffre, and Turvey. Mr. E. L. Orchard delivered a summary of the reports received, and discussed wheat varieties. Mr. J. J. Modystach read a paper, "Stable Manure." (Secretary, C. Cole.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Wepowie	31/10/32	14	Address—E. L. Orchard .	E. Roocke

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

YANDIAH.

February 10th.—Present: Nine members.

Seeding Preparations.—Mr. R. Giddings contributed the following paper:—"The practical farmer generally begins preparations for seeding in harvest time. When reaping, always select seed from the best crops, picking out seed true to type and free from oats, barley, &c. Grain from red land will be found less liable to disease, and generally a better and heavier sample. After harvest it is a good plan to get in super in case trouble causes delay. During the slack time between harvest and seeding overhaul the drill or combine, seeing that all cogs and bearings are in order, and clean the stars.

For any parts that are worn spare parts should be ordered, to avoid delay in the middle of seeding. Mend and overhaul all harness and swings. The harrows should be sharpened, or, if the tines are worn, they should be laid so that they will do the work properly. Having all the necessary implements in good working order, the seed wheat should be cleaned and pickled. The wheat should be graded, if possible, otherwise a winnower with a good screen can be used to remove all small grain, drake, and other foreign seeds. A good, plump sample, free from cracked and small grains, will give a good germination and a stronger plant. Pickling should be done carefully and thoroughly. If dry pickle is used, see that the dust is spread as evenly as possible on all grain. If bluestone is used, see that the bag remains long enough under the water to become thoroughly saturated, and allowed to drain properly before stowing away. On farms where the work is to be done with horses, the team should not be left out in the paddock until wanted to start work. As soon as feed in the paddocks begins to get scarce the horses should be given a feed of chaff or hay every day to keep up their condition. They can then be expected to do a good day's work as soon as seeding operations commence. If a tractor is used, see that supplies of fuel and oil are not too low, and overhaul the engine to ensure a clear run throughout." (Secretary, Mr. F. Jettner).

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Redhill	6/2/33	8	Address—J. O. Hatter ..	S. Pengilly
Gladstone......	11/2/33	14	Harvest Reports	L. Sargent
Yandiah	27/1/33	12	Harvest Reports	F. Jettner

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BRINKWORTH (Average annual rainfall, 15.74in.).

February 6th.—Present: 12 members.

Harvest Reports.—Mr. G. Ottens reported good winter rains but spring conditions were unsatisfactory owing to weather being too cold and unseasonable. Crops made rapid growth in winter, but did not yield according to appearances. Results:—Ranee, 6 bags per acre; Currawa, heavier crop, but only yielded 14bush.; Nabawa, good sample, 24bush.; Free Gallipoli, heavier crop, but did not yield any more; stubble land crops were lighter, returns ranging from 8bush. to 18bush. per acre, Aussie proving to be the best yielder. Mr. C. Ottens—Grass land: Canberra, heavy crop, affected with hay blight and rust, 5 bags per acre. Fallow: Currawa and Golden Return, 9 bags per acre; Ranee, 8 bags; Sword, 9 bags: Stubble land, 3 bags per acre. Mr. G. Walladge—Stubble land: Palestine oats germinated well and made good early growth, but made little headway in spring and became badly affected with rust, yield 2 bags per acre; Barley was a little better. Fallow: Felix, heavy crop in winter, lodged badly early in spring, badly affected with rust, 19bush. per acre; Currawa, in same paddock, 7 bags; next paddock, sown with drill and cultivator instead of combine, Sword 11 bags, Nabawa 8 bags, Ranee 8 bags; drilled paddock 2 bags per acre better than combined. Mr. E. Ottens—Stubble land on sandy soil: German Wonder, very badly affected with hay blight, 3bush. per acre; Ranee 10bush, Nabawa 12bush. Fallow: Golden Return, slightly affected with flag smut, 7 bags per acre, Currawa, very heavy crop, excellent grain, but only yielded 9 bags per acre; German wonder, showed a good deal of red rust, only yielding 7 bags per acre; Ranee, 9 bags per acre. Mr. L. Ottens—Stubble land, 4 bags per acre. Fallow: Waratah, sown very early, 6 bags; Gallipoli, showing a good deal of red rust, 8 bags; Free Gallipoli, no rust, but did not yield any more; Ranee, excellent crop, grain, &c., 12 bags per acre; Golden Return, heavier crop, but only yielded 8 bags. Mr. H. Snow—Ranee 10 bags per acre, Sultan and Felix (very rusty) 5 bags, Sword 7 bags, Golden Return 9 bags, Noongah 7 bags; 60 acres of oats yielded 11 bags per acre and 40 acres of barley averaged 7½ bags. Mr. A. Ottens started seeding on May 2nd—Ranee, very good crop, yielded 10 bags; German Wonder 23bush.; Late Gluyas, badly affected with red rust, grain pinched and light, 17bush.; Bena, also severely affected with the same disease, 16bush.; after a spell of a fortnight, seeding operations were recommenced, when Nabawa and Sultan were sown, the former yielded 24bush., the latter, although an exceptionally heavy crop, only yielded 23bush. Seed and super sown at the rate of 60lbs. and 62lbs. respectively. Mr. F. Pedler—Seeding commenced on May 14th with Guyra oats sown on land cultivated, which yielded heavily considering the cultivation, 41bush. per acre; Calcutta Cape oats sown May

16th yielded 32bush.; wheat sown on fallow May 20th: Selected Golden Return 28bush., this was followed by Currawa, which yielded 21½bush; Yilma was the next variety, yielding 24bush.; Ghurka was sown next and averaged 28½bush; another piece of ordinary Golden Return was sown and yielded 24bush.; Selected Ghurka was the best yielder of the season with 32½bush.; Sword was sown next yielding 29bush., another piece of Sword sown three days later yielded 26bush.; Canberra yielded 18bush., although appearing good enough for double that amount, rust being responsible for its downfall, which also affected Sultan, the next sown, which yielded 14½bush.; Selected Carmichael's Eclipse, sown in the same paddock as the latter three varieties yielded 22½bush.; Mulga oats completed the seeding, yielding 36bush. All wheat sown on fallow at the rate of 60lbs. seed and 95lbs. 48 per cent. super per acre. Five one-acre plots were also sown with the following results—Free Gallipoli 19bush., Ranee 28bush., Rajah 6 bags, Mogul 28½bush., Ghurka, Werribee Selected, 29bush. Selected seed showed an improvement of 4bush. an acre over ordinary graded seed. Mr. E. Carlyon read an extract, "Home Consumption Price for Wheat," which aroused a keen discussion. (Secretary, E. H. Ottens.)

LIGHT'S PASS.

February 6th.—Present: 30 members and visitors.

The February meeting took the form of a Field Day. Dr. Callaghan and Mr. J. L. Williams (Roseworthy Agricultural College), accompanied by Mr. J. B. Harris, attended on behalf of the Department of Agriculture. Starting at 9 o'clock, visits were paid to the gardens of Messrs. B. Boehm, S. and L. Plush, G. Wishart, and W. G. Ahrens. The object of this visit was to inspect the progress of the experiments being conducted by the Department of Agriculture, the Light's Pass Branch, and individual members. Much interesting work was seen, and useful knowledge was gained. A lengthy discussion on the various results of experiments took place at the evening meeting. (Secretary, C. Verrall.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Stockport	—	—	Local Crop Competition Report	L. Klaffer
Lyndoch	10/1/33	9	Discussion	J. Hammatt, Williamstown
Lyndoch	7/2/33	14	Address—F. Waddy	J. Hammatt, Williamstown
Buchanan	10/2/33	8	Crop Reports	L. Bell, Marrabell
Brownlow	14/2/33	12	Annual Meeting	F. Roocke
Rosedale	7/2/33	14	Annual Report	S. Sincock
Black Springs ..	21/2/33	7	Harvest Reports	K. Dunn
Penwortham ...	16/2/33	11	Address—W. C. Johnston	A. Jenner

YORKE PENINSULA DISTRICT.

BOOR'S PLAINS (Average annual rainfall, 15.61in.).

February 3rd.—Present: 13 members.

Harvest Report.—The following was supplied by Mr. W. Harris:—"During the early growing period and spring crops promised well, but the district, as a whole, did not yield as well as most farmers expected. Frost and haydie accounted for reduced yields in many instances, while rust was noted on certain varieties. Our best yield was from a field of Nabawa, sown on fallow ground, about the third week in May, with 75lbs. of seed and 90lbs. of 45 per cent. super; yield, 28bush. to the acre. Next was Waratah, sown before the end of May on fallow ground, with 75lbs. of seed and 90lbs. of 45 per cent. super: 24bush. on 300 acres; 60 acres of well worked grass land, sown the first week in June with Gluyas' Early, yielded 21bush. from a sowing of 75lbs. of seed and 90lbs. super. We combined in stubble ground the last week in April with Waratah, which yielded 16bush. from 75lbs. seed and 90lbs. of super. Gluyas Early combined in after one working on stubble ground with the same amount of seed and super, sown the first week in May, yielded 15bush. Gluyas' Early, sown the second week in June on stubble ground, with 75lbs. of seed and 90lbs. of super, only yielded 9bush; rust appeared to have done a good deal of damage to this crop. The average yield was 20bush. Oats drilled on stubble ground for hay yielded about 30cwts. to the acre. (Secretary, S. Chynoweth.)

KILKERRAN.

September 12th.—Present: 12 members.

Improving the Dairy Herd.—Mr. B. A. Koch presented the following paper:—"The improvement of the dairy herd can be accomplished in several ways, either by purchasing higher producing stock or by breeding. The latter is the cheaper method because high producing cows are almost unprocurable, except at a big figure. To improve an existing herd, first procure a high class pure bred bull from registered stock. These bulls are more plentiful now, and the Government subsidises up to 50 per cent. of purchase price, with a maximum of £25. The test of the bull's dam should not be overlooked even when buying registered stock. It is quite possible that a cow may produce only enough to pass the Government standard, whereas another cow may produce nearly twice as much. The bull's dam is the chief controlling factor of the heifers that he will produce. Before purchasing a bull see that the bull's dam has a good udder well up the back and well forward on the belly; also that she milks easy and has good teats. A good bull may seem expensive in the first place, but he will soon repay his first cost in his progeny. Test the herd and find out which are the best cows; this, where a number of cows are kept, is the only way of ascertaining which are the best producers and will enable the farmer to cull out all the boarder cows. A cow that does not produce at least 250lbs. of butterfat per lactation period is not worth keeping; she should be fattened and sold to the butcher. The same should apply to heifer calves; keep only those from the best cows in the herd. When buying stock great care must be taken to see that they are free from disease." The speaker referred members to Bulletin No. 273 issued by the Department, which deals very fully with mammitis, milk fever, and contagious abortion. This, he said, should be read by everyone handling a dairy herd. The paper concluded with an extract dealing with the culling of dairy cattle.

1933 CALENDAR 1933

JANUARY

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FEBRUARY

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MARCH

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JULY

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1934 CALENDAR 1934

JANUARY

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FEBRUARY

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MARCH

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APRIL

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JUNE

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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● FULL MOON.

How to Make Farm Life More Attractive.—Mr. B. J. Koch read the following paper at the October meeting:—"Various opinions are held concerning this subject. What one person may regard as a drudgery another may look upon as a pleasure. *Sidelines on the Farm.*—It is admitted that this work is inconvenient at times, because it must be done regularly if the best results are to be obtained, but there are very few sidelines, if any, on the farm which have not their disadvantages. It has much to do with the arrangements made to carry on this work, both the housing accommodation of the stock as well as the staff controlling them. Here the staff will be given an opportunity to practice co-operation one to the other which will have a tendency in helping to make farm life more attractive providing, however, it is carried out in the right spirit. *Expenditure.*—The housing accommodation for the sidelines need not be first class simply because a neighbor has it so; it is quite possible that there is a simpler and cheaper way of doing it if funds are not available to provide elaborate sheds, &c. It is better to arrange things in a cheaper way and be able to pay for them, providing the work is done well, rather than to incur more expense and then have to square the bill with the aid of outside assistance. This may only cause discord between the staff if they are all interested, and will not help in making farm life very attractive. This does not only concern sidelines but other items on the farm as well. Tidiness and good system are attractive. It is a pleasure to visit a homestead and find everything clean and tidy. To keep things in their proper place is time saving. Make this a habit, and one can rest assured of finding things when wanting them. Good fences also add to the appearance of the property. Business-like management on both sides of the family brings its reward, and attraction will follow naturally. *Farming Methods.*—The ground allotted for cultivation should receive every attention, especially fallow. If neglected a heavy loss may result, which will be detrimental to the farm. Well-worked land helps to beautify the farm. It will be pleasant to the person who passes by, and a credit to the man who owns it. Only varieties of seed recommended for the district should be sown, and it should be free, so far as can be ascertained, from all inferior qualities. A heavy dressing of super should also be applied, but not too much seed, if sown for grain, especially when graded. The observance of these points may have a tendency, if weather conditions are favorable, to improve the yield of the land and prove more valuable to the farmer. The most economical way of working the land is with a good team of horses in addition to a small tractor, if the farm warrants it. The team is a valuable asset when horses are in such strong demand and bringing such high prices. The part that the Bureau plays in farm life should not be overlooked. Here farmers meet and discuss problems of interest to both young and old. An opportunity is given to learn one from the other, and to help rectify troubles on the farms." (Secretary, Mr. E. Koch.)

WESTERN DISTRICT.

GOODE (Average annual rainfall, 9.95in.).

January 18th.—Present: Seven members.

Harvest Reports.—Owing to the combination of the two most destructive diseases—take-all and red rust—averages were comparatively low. Mr. E. Fear stated that his best wheat was Quality, although he also had good results with Canberra. Mr. B. Klau said that over a period of years, Late Gluyas was his best wheat. Mr. C. Wills' best wheat was Nabawa, which yielded 5 bags per acre. Mr. Will did not think it a wise plan to sow too much Nabawa as it "goes down" badly. Mr. B. Linke stated that his best wheat was Nabawa. It was generally believed that Nabawa was one of the best wheats to sow in this district. Mr. W. Pfeiffer gave an address, "Gas Producer Engines." (Secretary, B. Linke, Ceduna.)

LAURA BAY.

December 13th.—Present: 17 members.

Harvest Operation.—The Secretary, Mr. W. L. Edson, read the following paper:—"Harvesting is the most important operation on the farm because it is the time which shows either a surplus or deficiency in the balance-sheet; therefore no pains should be spared in attaining the highest efficiency. The header, harvester, and stripper are the main implements in use, and all grain lost by these machines cannot be recovered. I favor the header on account of its ability to handle crops under practically any circumstances. This machine when new will thresh in practically any weather, but as the machine gets older the drum bars lose their severity. If, however, the operator watches the number of bags each round and alters the concave there is no need for any undue waste. A steady, even pace is most essential, up hill as well as down, and as the blast can be altered without any loss of time it should be shifted as often as necessary, according to the density of the crop. Oil is cheaper than spare parts. I am using heavy second-grade oil, and think it will be cheapest in the long run; it is free in the mornings and not so thin in the extreme heat of the day. The stripper is a very handy machine and in favorable weather is most efficient, and with reasonable care one will last for many years, it has the least wear of any harvesting machine, and should bulk handling come into favor, the stripper and the power winnower will be most suitable.''

Horse Breeding.—Mr. C. Collins read the following paper at the November meeting:—''Now that draught horses are scarce and dear we cannot pick and choose from the best horses to breed from, but we should try to breed from the best mares we have. Some are more profitable than others, and will have a foal each year without any trouble; these are the mares to breed from. Try to select a stallion which is good-tempered and a reliable worker, one that works in the team with other horses, leaves dependable stock. If the horse can be turned out in the paddock with about 20 mares it will save some trouble and time. I favor private ownership of the stallion, because this generally means that the horse will receive proper treatment. I favor big horses, with a good tuft of hair on the legs and heavy mane and forelock, round in the bone, and large hard hoofs. I strongly oppose any license being placed on stallions. They have been kept by men who have been loyal to the horse, and it would be unfair to tax owners in any way. For breeding light stock for the farm, put a fairly clean legged draught mare to a good blood stallion. Feed the mares well after foaling and do not wean the foal early. When working the mother the foal will be quite contented if shut in the yard with another horse. Any horse that will work is better than none at the present, but try to breed from the best tempered and most reliable mares.''

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Mount Hope ...	14/2/33	8	Question Box	A. Myers
Maltee	9/2/33	8	" Blacksmithing "—Mr. Chant	E. Schwarz
Kelly	11/2/33	16	" The Kitchen Garden "—O. Freeth	P. Grund, Kimba
Smoky Bay ...	18/2/33	8	Discussion	K. Harrison

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EASTERN DISTRICT.
(EAST OF MOUNT LOFTY RANGES.)

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).
January 21st.—Present: 13 members.

Being the first meeting after harvest, members brought samples of wheat for weighing. Thirty samples were weighed ranging from 58lbs. to 64½lbs., the average being 62.1lbs. (Secretary, C. Altmann.)

MURRAY BRIDGE (Average annual rainfall, 13.59in.).
January 25th.—Present: 10 members.

Returns from Pigs.—Mr. F. Lehmann read the following paper:—"Looking back at returns for baconers for the last 13 years, the average return per pig is £3 18s.—the highest being £5 8s. 11d. in 1926, and the lowest £2 10s. per head in 1932. With such low prices it is essential that the very best methods are necessary if producers are to get some return for their labors. Naturally, the pig is a grazing animal and requires green fodders in the shape of grasses in winter, or summer fodders, such as lucerne pumpkins, &c.. The old system of sty feeding is expensive, on account of the labor involved and the cost of grain feeding to store stock. The better method is to have a number of wire-netted paddocks—18in. x 1½in. netting is preferable—that can be sown to barley or oats for winter grazing, with shelters of small straw stacks, or iron sheds that can be shifted to clean grounds free from vermin. The straw stacks can be burnt. The pig requires plenty of water for drinking purposes, and the animals should also be provided with a mud bath. The method I have adopted to rear and fatten is to shut up the breeding sow in a sty 10 days to a week before farrowing. When the pigs are a month to six weeks old let the sow out to graze and give her and the young ones the spare skim milk. The stores and others are fed in open, the ground being hard clay soil, the whole barley is strewn in a long narrow row on the ground, so that no one pig—large or small—gets more than its share. About ¾lb. of grain per pig with grazing is sufficient. These pigs grow quickly, and on account of the exercise in looking for their food, develop into healthy and meaty animals. When nearly fit for market they should be shut up in small yards or sty for four to six weeks. For fattening purposes, feed either whole or crushed grain. The Murray Swamp areas have the advantage of green fodders, especially lucerne, plenty of water, and supply of skim milk; but as most of the feeding ground here is of a sandy nature, I would put down shallow concrete troughs, 3ft. to 4ft. wide, on a slope, so that the rains would drain well away. Excepting for the outlay of capital for sheds, wire netting, and fences, the experse for machinery and tools is very small, and labor for feeding, &c., does not require much time. The price for baconers has always fluctuated with the price of cereals, so it is to be noted that the price of grain is the main factor in the value of the pig, and also of its quality."

Mr. S. McAuley gave an address, "Growing, Harvesting, Marketing, and Feeding of Barley." (Secretary, Mr. M. Hoare.)

SOUTH AND HILLS DISTRICT

HARTLEY (Average annual rainfall, 15in. to 16in.).
January 11th.—Present: 10 members.

Mangel Growing.—Mr. W. Yeates read the following paper:—"Mangels are good fodder for cows and pigs. Grown in stubble soil, they yield an abundance of green feed through summer without irrigation, and they respond to the lightest shower of rain. Some cows do not eat the leaves readily, but if left in the sun to wilt most cows get a liking for them. For fattening pigs mangels are not of much value, but breeding sows and boars will practically live on them. The seed should be sown towards the end of August, or the beginning of September (if it is decided not to transplant); then there is no danger of the plant running up to seed. The best way is to sow by hand, not too thickly, for what looks like one seed will often send up several plants. If the weather is inclined to be dry and the soil not too moist, the seed should be sown about 2in. deep, but in wet weather or very damp soil half this depth is plenty, the young plant taking four or five weeks before it shows through the ground. Weeds must be cleaned out as soon as they can be distinguished from the mangels, and the mangel plants themselves should be thinned out. Always leave the strongest plants. In about 8 or 10 weeks start picking the leaves, and continue about every 3 weeks right through the summer. If left too long without being picked the bottom leaves wither, drop off, and are wasted. When the first autumn rains fall the mangel grows very quickly, keeping on right into the winter, when they can be pulled for use as required, or stacked in a heap and covered with straw, when they will keep for a long while. Mangels will grow and do well in soil that is too salty or too full of magnesia for other plants, such as lucerne, barley, &c. A few crops of mangels will remove the salt, and the soil will then be suitable for other fodders.''

CALVES.—Paper read by Mr. A. Brook at a meeting held on February 8th:—''When a cow is about to calve she should be put into a paddock away from the rest of the stock. She should be left for 24 hours after calving before she is interfered with, so that the calf is not disturbed until strong enough to walk. The calf should be allowed to run with the cow for 4 days, and with heifers a week. This helps the cows to get their full supply of milk, and it also reduces the risk of mammitis. When the calf is taken away it should be hidden from the cow, because it spoils a cow if she finds the calf after being separated from it. If possible, the calf should be kept in a sheltered position. After the calf is taken away from the cow it is best to leave the calf all day without food. This makes it hungry, and easier to start with the bucket. In starting the calf to drink, keep your fingers out of its mouth. Place just enough milk to cover the calf's nose and mouth when its head is pushed down into the bucket. Hold its head there until the calf is forced to open its mouth to breathe; then release its head so that it can breathe. This only has to be done a few times before the calf will take the milk of its own accord. Patience is required when feeding calves; they are very timid and easily upset, and then they will not take their food. It is most important to keep the buckets clean. Dirty drinking utensils and sour milk will soon cause trouble. For the first week the calf should be fed three times a day; after this period twice a day is enough. After 3 or 4 weeks a handful of pollard should be mixed into the milk. The cheapest way to obtain pollard is to crush some wheat and sift the pollard out of it. When there is no green feed about add a little bran or pollard to the chaff. If it is desired to sell the calf do so when it is about 8 to 10 weeks. At this age most calves are in good condition, and realise the best price. If the calves are left ''on the cows'' for 6 weeks, and then sold, they will often bring as much as the 10 weeks' old hand-fed calves. Bull calves fatten quicker than heifers, but there is a slightly better market for the former.''

THE BENEFIT OF CROP COMPETITIONS.—Paper by Mr. T. Jaensch:—''Crop competitions are a very important activity of the Agricultural Bureau. First and foremost, the farmer realises that if he is to be successful he must work his land properly, and try and do better than the other competitors. It is also a very definite means of improving the seed wheat. Further, the owner of a crop recommended for seed can usually dispose of it at a price above f.a.q. In selecting seed wheat, the best plan is to harvest the crop with a stripper, to keep the seed wheat true to type. Care must be taken in pickling, especially if a dry pickler is used. The machine must be opened, cleaned out thoroughly, and revolved, until no grains remain.'' (Secretary, D. Harvey.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Milang	8/2/33	—	Address—R. Baker	L. Yelland
Jervois	12/1/33	27	"Potato Experiments"—Mr. Schultz	F. Baily
Cherry Gardens	28/1/33	11	Field Day at Balhannah	A. Stone
Mt. Compass	2/2/33	35	Address—C. H. Beaumont	C. Verco
Shoal Bay	7/2/33	9	Discussion	E. Bell
Langhorne's Ck.	8/2/33	9	Address—H. B. Barlow	P. Nurse
Hope Forest	6/2/33	20	Address—H. B. Barlow	E. Muldoon
Macclesfield	16/2/33	13	Address—C. Stamp	H. Ross
Port Elliot	18/2/33	16	Address—N. A. Foorde	J. Colebatch, Victor Harbor
Kangarilla	10/2/33	9	Address—J. Potter	T. Golder
Narrung	4/2/33	29	Address—E. R. Broadbent	W. Lawrie, Point McLeay
Balhannah	10/2/33	16	"Care of Horses"—B. Coleman	C. Grasby
Balhannah	28/1/33	80	Field Day	C. Grasby
Mount Barker	20/2/33	—	Address—C. H. Beaumont	P. Wise

CROWN LANDS.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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S. B. WHITFORD,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

Dairying, at Mount Barker, Thursday, May 11th. (Secretary, Mr. P. Wise.)

River Murray, at Berri, Thursday, June 15th. (Secretary, Mr. E. J. R. Johnson.)

Eyre's Peninsula (West), at Ceduna, Wednesday, July 5th. (Secretary, Mr. K. Harrison, Smoky Bay.)

Far North, at Morchard, Wednesday, July 19th. (Secretary, Mr. A. McCallum.)

Southern, at Goolwa, Thursday, August 17th. (Secretary, Mr. D. Jeff Gordon, Currency Creek.)

Each Conference will commence at 10.30 a.m.

Roseworthy Agricultural College.

INVESTIGATIONAL WORK.

In a report to the Chairman of the Governing Council, Dr. Callaghan, Principal of Roseworthy College, states that some research work with pigs has been planned and is now under way. For the purpose of investigating the maternal characteristics of the dam, the increase of growth of the litter to a marketable stage (either as porker or baconer) under different systems of management and feeding will be studied. For this purpose all sows farrowing will be weighed, and each pig of the litter weighed four days after parturition. The sows will be accommodated in either the breeding sties or yards, and fed on different classes of food, and increases in litter and individual pig weights will be noted at different intervals during growth. The idea behind this scheme is to have a definite record of the productivity of every sow in the swine herd. Now that there are four main breeds of pigs at the College, namely, Berkshire, Tamworth, Large White, and Mid-York, some comparable results with the various crosses will be studied under the above system, and should lead to the accumulation of some very useful data. In addition to the four breeds named, negotiations have been finalised for the importation from New Zealand of a weaner boar and a weaner sow of the Canadian Berkshire strain.

In conjunction with this work it is hoped that some data of genetical interest may be obtained. For instance, the size of the head, particularly the length and breadth thereof, of the individuals of every litter is to be taken four days after birth and at a definite period, or periods, of maturity later. In this way, any correlations which may exist between length and width of head and the characteristics of the finished baconer or porker will be clearly followed, and if definite enough might prove of distinct practical importance.

During the month the Oenological investigations with an imported yeast, *Rioja tempranillo,* were continued. Results showed that a higher percentage of alcohol was produced by the local yeast, from a given amount of sugar (10.92 per cent. local, and 10.16 per cent. imported). The alcohol was determined by distillation and the use of the Pyknometer as the hydrometers were not sufficiently accurate. The local yeast left more sugar in the finished wine than the imported one (0.242 per cent. local and 0.137 per cent. imported). The sugar was determined by gravimetric methods.

Indications are that the imported yeast is superior. The fermentation is better, but unfortunately in this experiment, with unsuitable conditions there was an abnormal growth in the case of the imported yeast. This growth was responsible for a loss of sugar, and consequently less alcohol was produced. This explains why the local yeast produced more alcohol, at the same time leaving more sugar in the wine.

During the month the imported yeast was "acclimatised" to work in a must containing sulphur di-oxide. The culture was then added to several small vats of must. The port wine, which was thought to be affected with *casse*, was treated with Potassium meta bi-sulphite, Gelatine, and Tannin, then filtered and bottled, a treatment that proved quite satisfactory.

Roup in Fowls.

The Secretary of the Frayville Branch of the Agricultural Bureau reports fowls with swollen eyes, gasping for breath, and with a slimy discharge from the mouth, which prevents the birds from closing their beaks. Mr. C. F. Anderson (Government Poultry Expert) to whom this query was submitted, says that the birds are affected with roup, and he recommends examining the mouth and windpipe for any signs of cheesy-colored growths; remove these by scraping with a sharp stick, and then apply a little powdered bluestone to the affected part.

For those which are bad in the eye, make a weak solution of Condy's crystals, and dip the head of the bird in three or four times quickly; repeat this for three or four days. Add a few drops of kerosene to the drinking water, just sufficient to leave a light film on the water. Spray the roosting quarters with a 10 per cent. solution of kerosene and water. Do this about an hour before the birds go to roost.

"Gummosis" or "Die-back" in Apricot Trees.

Mr. G. Samuel, M.Sc., Plant Pathologist at the Waite Agricultural Research Institute, in company with Mr. J. B. Harris (District Horticultural Instructor) visited orchards in the Light's Pass and Angaston districts in November in order to make a preliminary inspection of apricot trees affected with "Gummosis." Mr. Samuel has supplied the following statement for the information of orchardists:—"In practically all cases I found that gummosis started a part of the way down a limb, and that the terminal buds were healthy and sappy and looked as if they would have burst if there had been no trouble lower down. The diseased part of the limb could easily be seen by the longitudinal cracking of the bark, with the occasional presence of gum exudate or merely by its duller look in comparison with a healthy limb. The limb was always brittle at this point, and when broken across the wood was found to be brown and dried out, in spite of the fact that the younger twigs higher up were often still white and sappy inside. The trouble appeared to be of the same nature throughout the district, and I took a number of samples of the browned wood from different trees and from different orchards. I later obtained some further specimens from an orchard at Highbury. When these were examined in the laboratory it was found that a fungus was present in the wood, and when cultures were made from the different samples the same fungus grew out of the wood in all cases. So far, however, this fungus has formed no spores which would enable us to identify it.

"From what I have seen in the field, and from the results of the cultural work, I feel convinced that "Gummosis" or "Die-back" of apricots as it occurs in the Lower Northern fruit districts is definitely due to a fungus which gains entrance to the limbs through wounds, and which invades the woody tissues of the branches at a rapid rate, probably advancing several feet up and down a limb in a few months. I consider that it should not be a very difficult disease to get rid of if the right methods are adopted. I think that the present practice of leaving diseased limbs in until the winter pruning will undoubtedly favor its gradual spread through a tree. There are two reasons for this. One is that the fungus is growing ahead inside the diseased limb the whole time, and many examples were seen where it had already got into the main trunk from infected limbs which had been allowed to remain on the tree for months. And the second reason is that wounds made on wood heal much more slowly in winter time, and are susceptible to fungus infection for much longer than when made in the summer time.

"Although much of the trouble is apparently due to a slow advance of the fungus through a tree, owing to its never being properly cut out, there are unloubtedly many cases of new infections through the pruning wounds on healthy limbs. These probably come from fungus spores blowing about in the air of the orchard, but we do not know, as yet, where these spores are formed. The longer diseased branches are left in, however, the more likelihood there is of the fungus in them forming spores, so that everything points to the advisability of removing diseased branches during the summer. It may be that the fungus is one of the bracket fungi, in which case the spores would come from these brackets, but certain points in the laboratory examination do not favor this idea. We are continuing the work of trying to get the spore stage of this fungus, and we are also sending it to the Imperial Mycological Institute, in England, to see if it can be identified there. The following orchard practices are indicated as a result of the work done to date:—

"1. Remove all diseased limbs *before the end of January.*

"2. Make sure that the limb is taken back well (say 6in.) beyond the lowest point where brown dry wood can be seen. Sometimes the browning of the wood does not go right across but advances along under the bark in a thin crescent. Make sure and get well below the smallest sign of the trouble.

"3. Burn infected limbs after removal.

"4. Dress large wounds with white lead paint or Bordeaux dressing."

Empire Timbers for Furniture, Panelling, and Sports.

A recent report from the Empire Marketing Board indicates that Australia was well to the fore at the Exhibition of Empire Timbers which has been held at the Forum Club. A walking stick of Queensland walnut was presented by Her Highness Princess Marie Louise to the Earl of Athlone, who opened the exhibition which had been arranged by members of the club in conjunction with the Empire Marketing Board. The Princess, in her turn, was asked to accept a walking stick of Queensland silky oak.

Australian walnut was prominently featured by the section occupied by one of the very few women furniture designers and makers. A bedroom suite attracted much attention. Specimens of woods hitherto almost unknown were to be seen among the exhibits—sacki-sac, kauri, jigger wood, and black bean, to name only a few. Silky oak can scarcely be reckoned with these, since it has been seen in London furniture shops for many months past. Sports goods show how Empire countries are co-operating in the making of rackets, landing nets, and bats. The squash racket represented Canada, Great Britain, and South Africa by its frame of red and white Canadian birch, by its crescent of English ash and its handle and wedge of South African obeche and mahogany. Then there were tennis and badminton rackets made of ash, sycamore from England, and the gaboon mahogany from India. The British West Indies supplied the greenheart with which the handle of the landing net was made. It is scarcely necessary to add that the cricket bat blade was of English willow, whilst its close ally, the handle—of sarawak cane—came from far away British North Borneo. The exhibits were generally so well chosen that the display gave a clear indication of the many varieties of wood produced within the Empire. A table and sideboard made of English burr elm and walnut possessed a richness of surface and pattern easily comparable with the most effective veneers, and, indeed, suggestive of marble. Cigarette boxes of grey-dyed English sycamore and Indian laurel were to be found by the side of hair brushes backed with Indian teak.

This particular exhibition is only part of the general endeavor to make better known in England the resources of the Empire in timber; an endeavor which is being assisted by the visits of forestry officers from the Dominions to the research station at Princes Risborough, and afterwards to consult with British firms in order that they can organise, on their return to the Dominions, the supplies of timber in accordance with United Kingdom requirements.

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Worms in Pigs.

Reporting that pigs on his farm were seriously infested with worms, a subscriber to the *Journal of Agriculture* has been advised by Mr. R. H. Macindoe, B.V.Sc. (Deputy Chief Inspector of Stock) that the eradication of worms is not easy, because the eggs passed out in the dung can withstand high and low temperatures, are capable of development in dry conditions, and can lie in the soil for months and still develop. Again, medicinal treatment with the most efficient drugs is expensive, as more than one treatment is required, but oil of turpentine in one teaspoonful doses administered in a cup of warm milk once a day for five days is fairly satisfactory, and at the same time cheap. To administer:—Have 1½ft. of rubber garden hose, ½in. diameter, with a funnel inserted in one end. The free end is placed in the pig's mouth and the milk and turpentine poured into the funnel slowly, allowing the pig to chew on the hose. At the end of five days give two tablespoonfuls of castor oil in a cup of milk, keeping the pigs in one yard by themselves during treatment, and turning them into a clean yard or small enclosed paddock after treatment, where no other pigs have been for at least a year previously.

But the most effective treatment of all is preventive treatment, which aims at preventing pigs from becoming infested, and this can be achieved by paying strict attention to sanitation, that is clean yards and sties, the reason being that the eggs of the worms are passed out in the dung and live in the ground for as long as one year, and the eggs can develop even though exposed to extremes of heat and cold and dry conditions. Make fresh yards on ground that has never previously had pigs running on it and dismantle the old yards and plough the ground up.

When sows are due to farrow, bring them into a clean sty after giving them 3ozs. to 4ozs. of castor oil with one dessertspoonful of oil of turpentine, mixed with half a pint of milk. The sows should be well scrubbed with soap and warm water, paying special attention to the udder, in order to remove dirt which contains thousands of eggs in order that piglets when suckling do not become infested by eggs which may be about the teats.

After farrowing, the sows and their young should not be allowed to run out on soil which has been contaminated by other pigs, and at the end of 10-14 days they should be turned out on the clean ground, preferably on ground which has just had a crop on it. Keep the feed and water troughs clean, also sties.

Seed from Competitions.

In an Oat Crop Competition conducted in the Mount Gambier District, the following competitors exhibited crops, which, in the opinion of the judge at the time of judging, would produce grain suitable for seed purposes:—G. F. Ferguson, Glencoe West, Algerian; F. W. Button, Yahl, Algerian; R. G. Messenger, Kalangadoo, Algerian; C. E. Kilsby, Glenburnie, Algerian; T. W. G. Sporer, Glencoe West, Algerian.

Calcium Carbonate.

In answer to questions submitted to him at the Conference of Agricultural Bureaux held at Stansbury, the Deputy Director of Agriculture (Mr. W. J. Spafford) replied:—

"For practically all portions of the agricultural areas of South Australia calcium carbonate has no fertilising value whatever, and this is particularly true of the wheat-growing districts of the State, where all of the soils have ample supplies of lime for all plant requirements.

"Finely-ground calcium carbonate, when not derived from shells, is a really good soil amendment, having the power to correct excessive stickiness and sliminess of some of the clayey patches of soil found here and there throughout the wheat-growing districts, but to be effective for this purpose must be applied at from 10cwts. to 1 ton per acre.

"Any benefit which might accrue to cereal crops from applications of mixtures of superphosphate and calcium carbonate can be taken to be wholly due to the superphosphate. In any case, superphosphate should not be mixed with calcium carbonate before applying to the soil, because the two tend to re-act one with the other, and this reduces the solubility of the phosphate."

Publications Received.

"Commercial Fruit Tree Spraying Costs." Bulletin 5. Price, 9d. net.
"Artificial Fertilisers." Bulletin 88. Price, 3s. net.
"Rats." Bulletin 30. Price, 6d. net.
"Butter, Cream, Cheese, and Scalded Cream." Bulletin 57. Price, 6d. net.
"Fish Meal as a Livestock Food." Bulletin 63. Price, 6d. net.
Bulletins from Ministry of Agriculture, England.

VETERINARY INQUIRIES.

[Replies supplied by Veterinary Officers, Stock and Brands Department.]

Hon. Secretary, Balumbah Agricultural Bureau, reports (1) *gelding with a soft swelling in the region of the scrotum following castration six months ago, and* (2) *cow gone off milk, and bone chewing.* Replies—(1) *Gelding*—This may be due to the presence of fluid in the sac. Treatment of the condition would be surgical and is not recommended. (2) *Cow*—The cow is suffering as a result of a deficiency of protein and minerals in her food. Try the following treatment:—Feed night and morning on crushed oats, 2lbs.; bran, 2lbs.; linseed meal, ½lb.; hay chaff, 1½ kerosene tins full. In this feed place 2ozs. of the following mixture night and morning:—Superphosphate, common salt, equal parts thoroughly mixed. (3) Treat the two cows which calved recently on similar lines.

Hon. Secretary, Agricultural Bureau, Boolgun, reports horse which shows symptoms of a partial paralysis of left-side limbs. Reply—The symptoms suggest that the horse has had a fall or some injury which has affected the spinal cord and nerves governing muscle movement on the left side. The only treatment which can be advised is to keep the animal in a stall and restrict movement as much as possible. The following powders should be given night and morning mixed in the feed:—Strychnine hydrochloride, ⅛ grain; sugar (powdered), 1 dram. This makes one powder. Obtain 20 and give as directed. Recovery may take place in a few months, but frequently the symptoms become worse and the animal has to be destroyed.

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Stansbury asks (1) *how long horse with strangles should be kept isolated, and* (2) *is slime on water likely to cause lambs to scour?* Replies—(1) Isolate animal for 7 to 10 days after apparent recovery. Incubation period is 3 to 10 days. (2) It is very doubtful if green slime on water is responsible for scouring. This is more likely due to parasitic trouble. Try drenching with 2 per cent. solution of bluestone as recommended for treatment of stomach worms, and give a change of pasture. The growth of green slime on water can be prevented by treating the water with bluestone at the rate of 1lb. bluestone per 10,000galls. of water.

Wilmington asks cause of bone growth on a horse's jaw and its cure. Reply—There are many causes such as infection with a fungus (*Bothriomycosis* or *Actinomycosis*) which generally gains entrance through a decayed or fissured tooth and ultimately causes a discharge of matter (pus) under the jawbone, or a fracture of the jaw through an injury. If the bone growth has a discharging centre and is foul smelling, an examination of the mouth should be made for the presence of a diseased tooth, which should be removed, the cavity afterwards being syringed out with a solution of washing soda (one teaspoonful to one pint of warm water) and then plugged with a piece of gauze soaked in tincture of iodine dilute. The plug should be removed and replaced daily until wound heals. If the growth is the result of knitting after a fracture no treatment will reduce the swelling. There is an outgrowth of bone which is sometimes, but rarely, seen, known as an osteoma, which is a tumor, the cause of which is not known. In these cases, if the tumor is connected to the jaw by a well-defined neck, it would be possible to operate and remove the growth.

Hon. Secretary, Agricultural Bureau, Hope Forest, asks cause of swelling on shoulders and neck of an aged gelding. Reply—Swellings such as these can be the result of various causes, such as fat condition in hot weather, feeding on food that is too heating, such as barley and other grains. Swellings on shoulders can be due to badly fitting collars or even the formation of abscesses deep-seated under the skin. If the animal is fat, cut out feeding on too much grain, and it may be necessary to add chopped straw to the chaff if it is full of grain. Two ounces of Epsom salts should be given in the drinking water twice a day for three or four days. The swellings should have the following solution dabbed on them every night and morning before and after work:—Zinc sulphate, ½oz.; lead acetate, 1oz.; water, 2 pints. Dissolve the zinc salt in one pint of the water and the lead and salt in the other pint. Then mix the two solutions together. Shake well before use. Internally give one teaspoonful of powdered nux vomica mixed in the feed with one tablespoonful of baking soda twice a day for five days. Quantity of nux vomica required, 2ozs.

Hon. Secretary, Agricultural Bureau, Appila, asks cause and cure of a soft lump on the hind fetlock of a mare. Reply—The swelling is what is known as windgall, which in this case is a distension of the capsule surrounding the fetlock joint with synovial oil. It is probably due to effects of work and there is no cure for the condition, though in early cases bandaging and blistering may be tried, but this is not advised for the case under discussion. Except for being an eyesore, the swelling causes no pain.

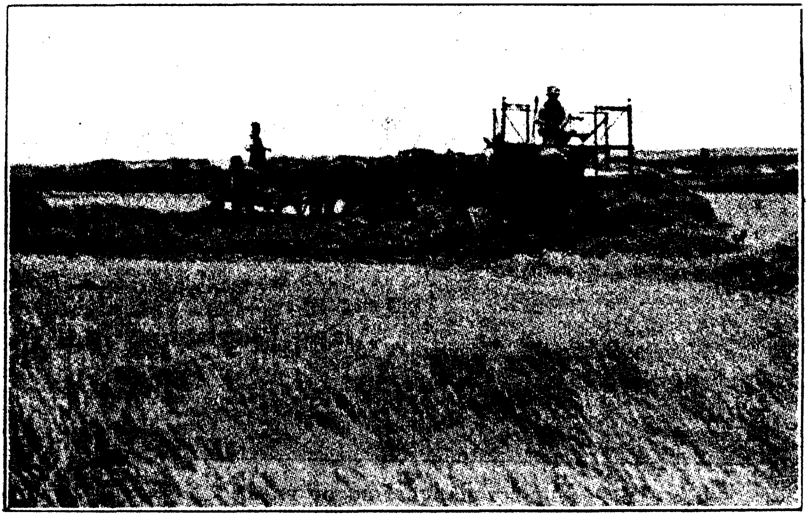
Kangarilla asks cause of horses rubbing themselves on trees and posts. Reply—A general itching of the skin may be digestive in origin and is often associated with high condition and good feeding. The following powder could be made up:—Epsom salts, 6ozs.; powdered sulphur, 2ozs.; bicarbonate of soda, 2ozs. Give 2ozs. of this mixture in a damped feed night and morning. Further give a bran mash occasionally.

Hon. Secretary, Agricultural Bureau, Narridy, asks treatment for horse with an itch.—Try the following treatment:—On a warm day, lather the skin with soft soap and water. Leave on for five minutes and wash off. Then with a body brush apply the following mixture:—Sulphur, 4ozs.; oil of creosote, 1oz.; vegetable oil, 1 pint. Mix and shake thoroughly before applying. Rub in well and repeat every three or four days for two or three weeks. Internally, give as a drench raw linseed oil, 1½ pints. If the horse is in fat condition, reduce grain in food.

PEA-GROWING IN SOUTH AUSTRALIA.

[By W. J. Spafford, Deputy Director of Agriculture.]

Peas have been domesticated for a very long time, and so are well known throughout the temperate parts of the globe. Some botanists claim that all of the kinds of peas usually cultivated belong to the one species, but they are more generally separated into *Pisum arvense*, which includes most of the Field Peas, and *Pisum sativum*, embracing the Garden Peas.



ROLLING-OUT PEAS ON A THRESHING FLOOR.

Until a few years ago the harvesting of the pea crop was an onerous and long drawn-out operation involving the cutting of the crop with mower or scythe, the carting of the material to a threshing floor, the freeing of the grain from the pods by tramping the mass with horses or cattle or running over the heap with a horse-drawn roller, the separation of the grain from the straw by throwing to the wind, and finally cleaning with a hand winnower.

The pea crop has come into prominence in the last few years as a crop to grow in rotation with wheat, but unfortunately the varieties so far tested in our conditions have too long a maturing period to produce payable crops of grain with certainty in districts with less than 18in. to 20in. of average annual rainfall. In all successful rotation of crops, where bare fallow is not practised or where it is only availed of occasionally, a leguminous crop is essential to tone up the land and to provide nitrogen, and until such time as we find leguminous crops suitable for our wheat-growing districts, bare fallow must remain as important as it is at present. So far the only leguminous crop we have been able to grow economically in any of our recognised wheat-growing districts is Field Peas, and this can be done with some certainty only in those locations where the rainfall is fairly plentiful. In the past one of the principal factors limiting the extension of pea-growing was the difficulty and expense of harvesting the crop, but with the invention of the pea-harvesting mouthpiece for the McKay reaper-thresher, the grain can be collected and cleaned as easily as is wheat. This machine has rendered profitable pea-growing possible in many wheat-growing districts where previously it could not be thought of.

CLIMATE FOR PEAS.

Until machinery improvements made it possible to harvest and clean the seed in one operation it was considered impossible to grow peas profitably in anything but the heavy-rainfall districts of South Australia. Harvesting methods were so cumbersome and demanded so much hand labor that it was necessary to secure very heavy yields of grain if the crops were to prove profitable, and so peas could only be grown in the best agricultural districts of the State. Although the area of country on which peas could be grown with a reasonable chance of success was greatly increased by the cheapened harvesting, fairly favorable climate is necessary to ensure that the crop will reach full maturity each year. Peas make strong, luxuriant growth, and to enable the plants to maintain this luxuriance sufficiently long to set and ripen a full crop of seed, fairly liberal rainfall and reasonably cool spring weather are essential. Very few districts in the State receiving less than 20in. of average annual rainfall have general climatic conditions suitable for pea-growing.

DIRECT HARVESTING OF PEAS.

The invention of a special pea-harvesting head-piece for the McKay Header has made the direct harvesting of peas possible. Provided the land is free of stcmps and stones, harvesting with this machine is a simpler operation than harvesting wheat, oats, or barley, because the comb runs on the surface of the land, and the raising or lowering of the machine is not necessary.

SOILS FOR PEAS.

Climate plays a greater part towards success with pea-growing than does the soil, because the crop grows well in most soils of normal fertility, provided that they are well supplied with lime. This crop removes five or six times as much lime from the soil as do the cereals, and although it will do fairly well where lime is not over-plentiful, the pea crop makes better growth where its lime requirements are easily met. Texture of the soil does not have a great deal of influence on the crop, provided that the land is not too sandy and dry, but like most cultivated crops, better returns are usually secured in loamy soils of high fertility.

PREPARATION OF THE SOIL.

Peas do nothing towards cleaning the land of weeds, and unless much care is shown in soil preparation before peas are sown, the crop leaves the field in rather a weedy condition. If peas are grown on fallowed land they usually make a strong growth of haulms, but carry a light seed crop, and so it is usual for this crop to follow a cereal crop or a pasture. The land should be cultivated as early in the autumn as the condition of the soil will admit, and then after a germination of weeds should be again cultivated. There is no need to give deep cultivation, but thoroughness in the soil working is usually followed by increased returns. If the first stirring can be done with a cultivator so much the better, but otherwise a plough must be used. The land should be harrowed after the first cultivation to encourage a germination of weeds, and before seeding a further cultivation and a harrowing should be given to clean the land.

THRESHING PEAS FROM A STACK.

If so desired the pea crop can be cut and stacked and then threshed at a convenient time by using the pea header as a stationary thresher.

POSITION OF THE PEA CROP IN A ROTATION.

Where peas and wheat are grown in the same rotation, and bare fallow is not included also, the peas will always immediately precede the wheat crop, because the soil is usually left in good heart after a crop of peas has grown on it. If the climatic conditions and soil are good enough to enable cropping to be carried out without bare fallow, a rotation, such as (1) peas, (2) wheat, (3) potatoes, or Mangels, or turnips, or kale, &c., (4) barley or oats, might be practised, and, if so, the peas would always follow the "second" cereal and precede the wheat crop. In the better wheat-growing districts of this State, where peas can be grown, it is possible to reduce the area under fallow by making the rotation somewhat as (1) bare fallow, (2) wheat, (3) peas, (4) wheat, (5) pasture, or even to follow the second wheat crop with oats or barley before leaving the land out as pasture.

SEEDING OF THE PEA CROP.

Peas require about the same amount of time to mature as do mid-season wheat varieties, so the seeding should not be delayed. In most wheat-growing districts, towards the end of May is about the best time to get the peas in to the land, and in the best of the cereal districts early June is quite late enough.

Two bushels of seed per acre should be drilled in with the ordinary seed drill in wheat lands, and about 3bush. in districts with good enough climate to be able to crop a rotation which does not need a bare fallow.

Superphosphate has a very beneficial effect on tho pea crop, so should always be supplied with the seed. In good conditions 2cwts. superphosphate per acre should be used, and in poorer conditions about 1cwt. per acre, or a little more.

EFFECT OF PEAS ON THE SOIL.

Peas have a wonderful power of toning up the land, and the improvement lasts for some years. It is common experience to notice where portion of a field has grown a crop of peas, the wonderful effect it has on the next cereal crop, and the increased vigor and better color is always visible in the second cereal crop on that land; it is often repeated with the third cereal crop, and can still be seen on occasions in the fourth crop. The amount of nitrogen collected from the air by the bacteria living on the roots of the pea crop is very considerable, but the benefit to succeeding cereal crops is only partly due to this cause, and peas in common with many other leguminous crops tone up the soil by activating most of the useful soil bacteria.

PEAS CLEANED AND BAGGED IN THE FIELD.

When direct-harvested the peas are cleaned and bagged, and left in rows on heaps in a similar manner as is done with wheat, oats, or barley.

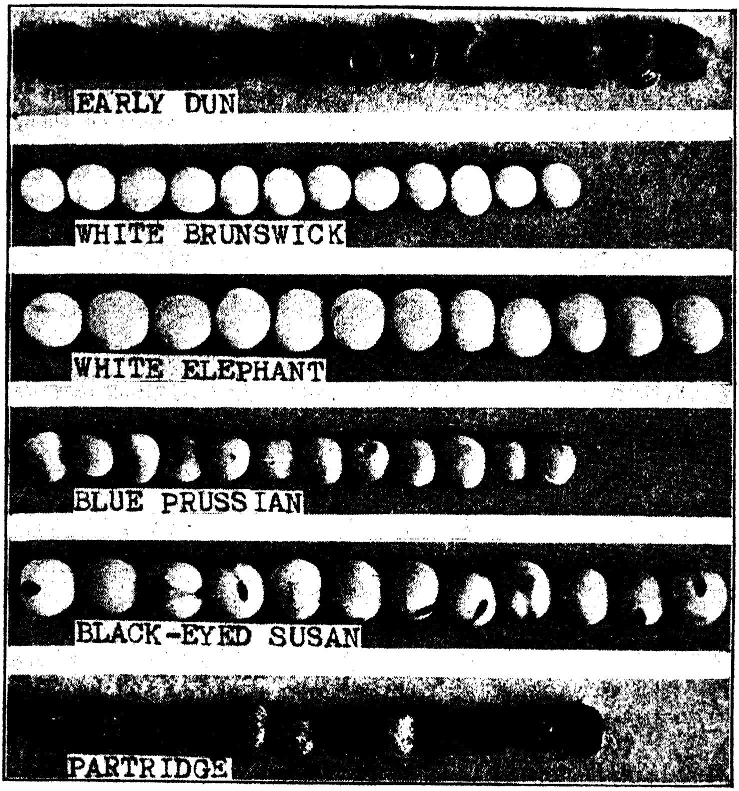
VARIETIES OF PEAS.

The principal peas grown in this State are handled as farm crops and are known as Field Peas, although the kinds grown for human consumption and known as Garden Peas are of considerable importance. Most of the Field Peas are characterised by carrying purplish-colored flowers, in which the standard or large petal is of a lavender shade and the side petals of a deep rosey purple, whereas the Garden Peas and some Field Peas carry white flowers.

Field Peas.

There are only two varieties of Field Peas of any importance in South Australia, the outstanding variety being Early Dun, and of recent years the White Brunswick has come into prominence. Besides these two varieties, small areas are sometimes sown to Partridge, Blue Prussian, Black-eyed Susan, and White Elephant.

The *Early Dun* variety of peas is easily the most important kind grown in the State, and gives really good yields in most districts where the average rainfall is more than 20in. per annum. Besides being a good cropper, the Early Dun has the very great advantage of not readily shedding its seeds after they are ripe. This characteristic is helpful to farmers because there is not the same need of haste at harvest time as is so with the other kinds. The name is derived from the fact that although the seeds are a greenish-grey color at ripening time they soon change to a dun color.



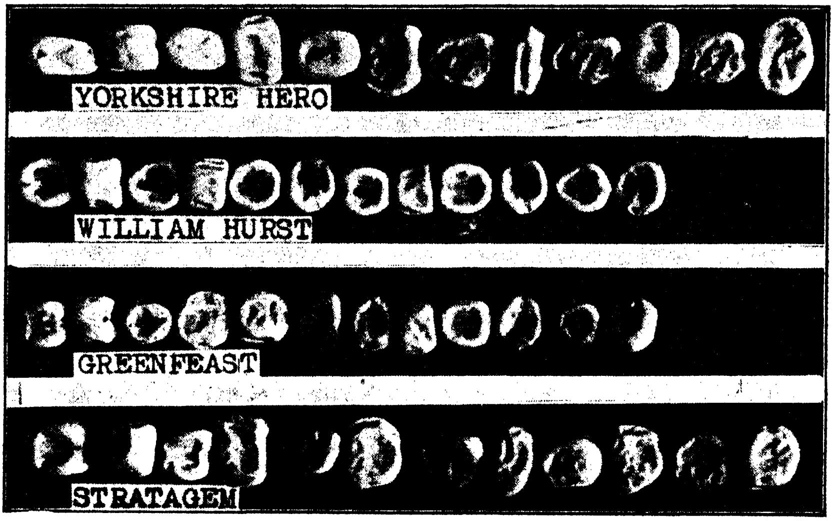
FIELD PEAS GROWN IN SOUTH AUSTRALIA.

Of the six varieties of Field Peas grown in the State, Early Dun and White Brunswick are of outstanding importance, although the area sown to Black-eyed Susan is increasing. The illustration shows the relative size of each variety and is particularly interesting in connection wth White Brunswick and White Elephant, because they have seeds of similar shape with skin which is almost snow white, but the difference in size is very marked. The distinct blue color of Blue Prussian has unfortunately been lost in the illustration. The fact that Black-eyed Susan has a colored skin (pinkish) instead of the very white skin of the other two varieties is brought out in the picture. Maple Peas have the same mottled skin as is to be seen with Partridge Peas, but the seeds are much larger.

White Brunswick peas have been grown within the past few years in some districts where Early Dun peas have not been too successful because of insufficient rainfall. This has been rendered possible because the White Brunswick variety is a little earlier than the Dun, and matured soon enough to have avoided the damage which peas often suffer from the first hot winds of early summer. White Brunswick peas differ from most other Field Peas in that both the flowers and seeds are white.

This variety can be grown successfully in those wheat-growing districts of the State receiving an average annual rainfall of 18in. or more.

Partridge, *Blue Prussian*, *Black-eyed Susan*, and *White Elephant* varieties have never been grown extensively in South Australia, but are well-known in some of the other States, and grow well where fairly heavy rainfall is the rule. The *Partridge* pea and the *Maple* pea are very similar, although the former has medium-sized peas, whilst the latter has large seeds. They are both characterised by the seeds being of a speckled brown-grey color. The ***Blue Prussian*** is sometimes known as Blue Boiling Pea and is grown for drying for storing for culinary purposes. ***Black-eyed Susan*** is a strong-growing variety most suitable, because of the luxuriant growth, for growing for fodder purposes. Where the conditions are good enough for growing it heavy crops of grain are received. The seeds are very large, of a light color, almost white, with a large black spot at the hilum. ***White Elephant*** also requires good conditions, because it is a luxuriant grower, and when it is well grown this variety produces heavy yields of large, attractive peas of a white color.



PRINCIPAL GARDEN PEAS GROWN IN SOUTH AUSTRALIA.

The similarity in coloring of the dried seeds of the most important Garden Peas grown in the State makes it very difficult to show differences between the several varieties. It can, however, readily be seen that Yorkshire Hero and Stratagem have large seeds, whilst Greenfeast and William Hurst are small-seeded kinds, and the typical roller-like shape of William Hurst is distinctly shown, as against the irregular-shaped seeds of the other varieties.

Garden Peas.

There is a very large assortment of good varities of Garden Peas, most of them suitable for certain sets of natural conditions. A few of the most important Australian varieties are:—

Yorkshire Hero is easily the most important of the Garden Peas and can be described as the standard variety for Australian conditions. It is extremely hardy for general use and is particularly suitable for warm districts. Although the pods are a bit shorter than some of the other kinds, it is a very heavy yielder, and the pods are well-filled with peas of an excellent flavor.

Feeding Value of Peas compared with Cereals.

	Composition.						Digestible Nutrients.				Starch Equivalent.	Nutrient Ratio.
	Water.	Ash.	Crude Protein.	Crude Fat.	Nitrogen-free Extracts.	Crude Fibre.	Protein.	Fat.	Nitrogen-free Extracts.	Fibre.		
	%	%	%	%	%	%	%	%	%	%	%	
Green Forage—												
Peas..............	76·0	2·1	6·1	0·7	7·9	6·9	4·5	0·5	4·9	3·6	11·2	1 to 2·1
Wheat	76·0	1·9	1·4	0·2	14·3	6·2	1·0	0·1	9·7	3·4	12·1	1 to 13·3
Oats	76·0	1·9	2·0	0·6	10·7	8·8	1·5	0·4	6·7	5·1	10·4	1 to 8·5
Barley	76·0	1·5	1·7	0·4	12·8	7·6	1·1	0·2	9·2	4·9	12·7	1 to 13·2
Hay—												
Peas	10·0	7·6	15·4	2·8	37·0	27·2	10·2	1·7	22·1	13·6	32·8	1 to 3·9
Wheat	10·0	6·2	5·1	0·8	53·5	24·4	2·8	0·5	33·7	7·9	31·0	1 to 15·2
Oats..............	10·0	6·2	7·6	2·4	43·1	30·6	5·9	1·7	27·1	18·4	36·5	1 to 8·3
Straw—												
Peas..............	10·0	6·9	9·4	1·6	35·1	37·0	4·5	0·7	19·3	14·3	17·7	1 to 7·8
Wheat	10·0	5·0	3·2	1·3	37·7	42·8	0·2	0·4	14·0	21·4	11·5	1 to 181·4
Oats..............	10·0	6·0	4·0	1·7	37·7	40·6	1·4	0·5	17·3	21·9	17·9	1 to 28·8
Barley	10·0	5·8	3·5	1·5	36·4	42·8	0·9	0·5	20·0	22·4	19·4	1 to 48·3
Grain—												
Peas	10·0	2·9	23·5	1·7	56·2	5·65	20·3	1·0	52·2	2·6	74·5	1 to 2·8
Wheat	10·0	1·7	12·6	2·0	71·7	2·0	10·6	1·2	66·1	0·9	75·5	1 to 6·6
Oats..............	10·0	3·2	10·7	5·0	60·4	10·7	8·3	4·2	46·5	2·7	62·6	1 to 7·0
Barley	10·0	2·6	9·9	2·2	71·2	4·1	6·9	2·0	65·5	1·4	76·8	1 to 10·3

Greenfeast is a popular variety for market gardening purposes, the pods selling well because they are long, curved, and so well-filled that they have a rounded appearance. A good variety to withstand hot weather and dry spells.

William Hurst is a heavy cropper which comes in early. The plants bear an abundance of well-filled pointed pods of a dark green color and slightly curved. *Stratagem* is a very suitable variety for cool districts, and is an excellent cropper, carrying large pods which are long and flat.

USES OF PEAS.

Peas are one of the most important foodstuffs produced in the world, both for human beings and domesticated animals. Garden Peas are usually eaten as "green" peas, the pods being picked as soon as the seeds attain full size and while they are still soft. Field Peas are used as human food, either whole after soaking and boiling, or as "split" peas, as pea meal and pea flour. For livestock crops of Field Peas are used as green forage, silage, hay, or as grain, and in all ways they prove to be a first-class foodstuff, but are particularly valuable as a grain feed, the seeds being a highly concentrated foodstuff extremely rich in protein. The value of peas as a livestock foodstuff can be gauged by the figures in the table, where the various forms in which the crop is fed are compared to cereals.

The figures in the table show why Peas are such a good foodstuff; the very high content of protein in all forms in which the pea crop is utilised as a stock food make it a particularly valuable plant for growing animals or for those producing milk. There are no other foods usually grown on farms so rich in protein, and as a matter of fact the only other crops that contain as much or more of the substance are beans and linseed. Because of their high protein content Peas form an excellent material for mixing with cereal grains, and those other foodstuffs particularly rich in starch. Mixed with cereals, Peas make an excellent concentrated food for horses which are working very hard, but should always be crushed before being given to horses, because whole Peas swell considerably when moistened after being swallowed and are liable to lead to digestive troubles when this happens. For horses, peas should not form more than about one-third of the grain ration, the remainder being made up of oats and barley. Maize and wheat can also be used for all farm livestock in admixture with peas.

Crushed peas make a first-class foodstuff for pigs, fattening the animals very readily, and producing an attractive flavor in the meat, but the fat is hardly as white as when pigs are fed on barley or wheat.

The disadvantage of the pea crop as a green forage is that it does not grow again after being fed down, and so it only provides short-period grazing. It is a really good crop on which to wean lambs, but is usually utilised to fatten store sheep and pigs. When used for fattening purposes the crop is allowed to approach maturity so closely that the seeds are beginning to harden before stock are turned on to them, and some pea-growers wait until the crop is "dry" ripe before giving stock the run of the crop.

Although the hay made from the Pea crop is of good quality, it is not often stored in this way, because it is a difficult job cutting the crop; much care is necessary in curing the hay, and stacking is far from a simple job.

Really good silage is made from Peas, but, as with hay-making, some difficulty is experienced in handling the green growth.

The straw of Peas is much more used as a livestock foodstuff than any of the cereal straws, and when carefully stored stock do well on it when mixed with concentrates.

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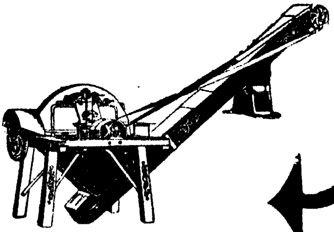

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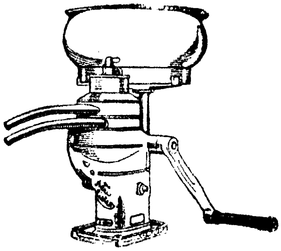

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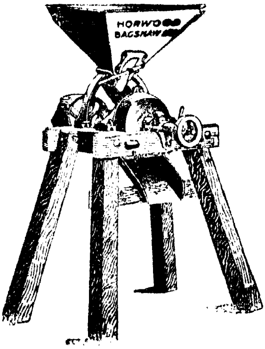

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ON THE CONTROL OF THE "LUCERNE FLEA" (*SMINTHURUS VIRIDIS L.*) IN LUCERNE IN SOUTH AUSTRALIA.

[By J. DAVIDSON, D.Sc., the Waite Research Institute, University of Adelaide.]

I.—INTRODUCTION.

The lucerne "flea" or lucerne "springtail" occurs throughout the better rainfall districts of South Australia.* It feeds on a wide range of weeds and on garden and pasture plants (*see* Holdaway, F. G. 1927, Comm. Coun. Sci. Ind. Res. pamphlet No. 4, p. 7). Of the cultivated pasture plants, it feeds especially on clovers and lucerne; grasses are much less affected. The insects eat out the mesophyll tissue of the leaves, which results in the characteristic, bleached appearance of affected areas in the pasture (Fig. 1). Clovers and lucerne afford excellent food for the insects and they multiply rapidly when the weather is favorable. When the food supply becomes reduced, owing to the destruction of the green leaves of the plants, they spread outwards and attack most green plants in the adjacent areas. During periods of heavy infestation, therefore, pasture grasses and young cereal crops may be seriously affected. It is also troublesome on seedlings in gardens.

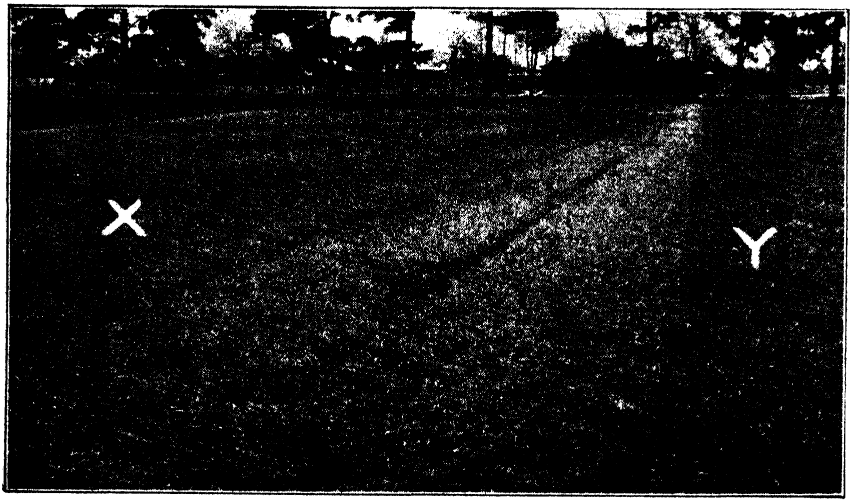

Fig. 1.—Lucerne infested with *S. viridis*. The sections X and Y are the areas used in the experiments. Photo. July 10th, 1931.

Owing to the general distribution of the species in moist situations in South Australia, one of the chief difficulties in the establishment of a clover or lucerne stand, is to protect it from invasion by the insects coming from surrounding areas.

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* W. L. Summers (*Journ. of Agric.* South Australia 1900, p. 18) points out that "flea" is a misnomer, the term "springtail" being more appropriate. The term is used because of its habit of springing.

II.—GENERAL HABITS OF THE INSECT.

The females lay their eggs in batches on the surface of moist soil, in crevices of the soil, or below vegetation and debris. A batch may consist of 100 or more eggs, but the number varies considerably, the average number being about 50 to 60. The eggs are about 1/100in. in diameter and are yellowish in color, but the female covers each egg, as it is laid, with a brownish fluid excreted from the anus. When this fluid dries, it holds the eggs in a batch together and forms a protective coat around each egg, which safeguards the eggs from predatory mites, &c., and from too rapid loss of moisture. This coating is the same color as the soil, so that it is difficult to find the egg batches in nature.

The active stage of the insect is restricted to the wet season, the duration of which varies with the season and the locality. Normally it extends from April or May to September or October. During this period the species may produce three or more generations. The nymphs on emerging from the eggs are active and closely resemble the adult in external characters, but are paler in color and relatively very small. They eat small holes in the leaves of clover and lucerne, giving them a speckled appearance, whereas the older nymphs completely destroy the green tissues of the leaves.

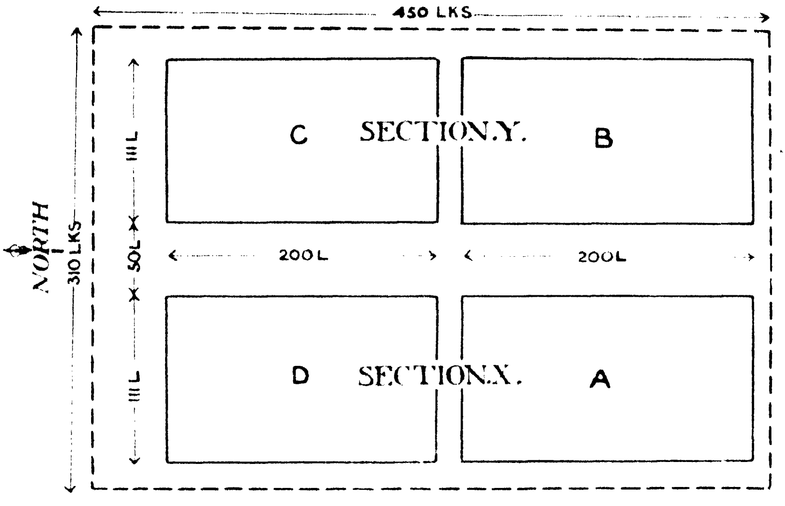

Fig. 2.—Diagram showing the position and area of the plots in sections X and Y of Fig. 1.

During the dry season the insect does not occur in an active form. The individuals of the last generation in spring die out with the onset of dry weather and certain of their eggs remain viable on the soil during the summer. The development and hatching of these eggs is inhibited owing to the lack of suitable moisture during that period. When the moisture conditions on the surface of the soil become favorable, with the onset of the wet season the following April or May, these eggs complete their development and hatch out. The warm soil, favorable air temperatures, and plant growth at this period favor the development of the insects, and with a continuation of suitable rains the population soon increases. During the period June to August, the population decreases and the insects are less active in many localities, owing to the wet, cold conditions at the soil surface. They increase in numbers and become more active again about September, owing to the more favorable temperatures and better moisture conditions at the soil surface.

III.—FLUCTUATIONS IN THE NUMBERS OF *SMINTHURUS* DURING THE WET SEASON.

An area of lucerne was sown at the Waite Institute in 1930 in order to record the progress of the population of *S. viridis* in the lucerne and to study the influence of environmental conditions on fluctuations in the numbers of the insect. The results of the experiments are being discussed elsewhere. (Davidson J. and Swan D. C. 1933, *Australian Journ. Expt. Biol. and Med. Sci.* vol. 11).

The area of lucerne was 450 links long and 310 links wide (1.395 acres). It consisted of two half sections, each 450 links long, a western section (X), and an eastern section (Y) (Fig. 1). The history of these two sections differed slightly, as shown below; also the soil in the eastern portion of section Y is poorer owing to an adjacent row of pine trees.

Section.	Date.	Remarks.
X Western half	May, 1930	Sown (after peas) with Hunter River Lucerne in drill strips.
	Sept., 1930	Ploughed up and re-sown with Hunter River Lucerne.
Y Eastern half	May, 1930	Sown (after peas) with Hunter River Lucerne and Chinese Lucerne in random drill strips.
	Sept., 1931	Ploughed up and re-sown with Hunter River Lucerne.

During 1930 the lucerne was invaded by *S. viridis*, which gradually spread throughout the block. The lucerne in section X made poor growth and was ploughed up in September and resown. By July, 1931, there was a heavy growth of weeds in section Y, the lucerne having been considerably checked by the insects. The September sowing of lucerne in section X made good growth and the insects were present in large numbers by July, 1931.† The condition of the infestation at this time is shown in Fig. 1. The characteristic, silvery patches of infested lucerne in section X can be clearly seen. The density of the population along the adjoining portions of sections X and Y is evident from the appearance of the lucerne, and is chiefly due to the movement of the insects from section Y into section X, owing to the scanty growth of lucerne in the former section.

The rainy season set in exceptionally early in 1932 and the insects were hatching out in the lucerne at the end of March. By May 5th the infestation was heavy, especially on section X.

Two plots, A D and B C, were marked out in sections X and Y respectively (Fig. 2). Each plot was 200 links long by 111 links wide (approx. 11.50 acre) and they were treated as shown in Table 1. The portions of the lucerne surrounding the plots was mown and sprayed as considered necessary, in order to restrict the spread of the insects from one plot to another.

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† It may be noted that ploughing does not destroy the eggs of the insect. Although they may be buried the young insects on hatching emerge through the open soil. When lucerne is sown in autumn the low temperature during the succeeding months may be unfavorable for rapid growth of the lucerne. As the conditions will be favorable for the insects the crop may suffer severely. With spring sowing the temperatures of the succeeding months will be favorable for the growth of lucerne, but the conditions will become gradually less favorable for the insect.

TABLE 1.—*Showing the Treatment and Yields of the Plots of Lucerne shown in Fig. 2.*

Date and Treatment.	SECTION X.	
	Plot A.	Plot D.
1932.		
May 5	*Mown.*—Air-dry hay 91·87lbs. = 3cwts. 81lbs. p. ac.	*Mown.*—Air-dry hay 58·89lbs. = 2cwts. 44lbs. p. ac.
July 15–17	*Mown.*—Air-dry hay 31·15lbs. = 1cwt. 29lbs. p. ac. Samples of *S. viridis* population taken April 26th to July 15th (*see* Fig. 3)	*Grazed.*—140 sheep, 2 days 8 hours, per day.
July 22	*Sprayed.*—Lime-sulphur 1 : 50	*Sprayed.*—Lime-sulphur 1 : 50
Oct. 6	*Mown.*—Air-dry hay 6cwts. 52lbs. = 1 ton 9cwts. 43lbs. p. ac. Estimated per cent. lucerne, 45%	*Mown.*—Air-dry hay 5cwts. 66lbs. = 1 ton 5cwts. 45lbs. p. ac. Estimated per cent. lucerne, 56·5%
Dec. 7	*Mown.*—Air-dry hay 4cwts. 108lbs. = 1 ton 2cwts. 63lbs. p. ac. Estimated per cent. lucerne, 100%	*Mown.*—Air-dry hay 4cwts. 105lbs. = 1 ton 2cwts. 50lbs. p. ac. Estimated per cent. lucerne, 100%
	SECTION Y.	
	Plot B.	Plot C.
May 5	*Mown.*—Air-dry hay 102·04lbs. = 4cwts. 16lbs. p. ac.	*Mown.*—Air-dry hay 78·17lbs. = 3cwts. 19lbs. p. ac.
May 6	*Sprayed.*—Lime-sulphur 1 : 60	*Sprayed.*—Lime-sulphur 1 : 60.
July 15-17	*Mown.*—Air-dry hay 76·9lbs. = 3cwts. 14lbs. p. ac.	*Grazed.*—140 sheep, 2 days, 8 hours per day
July 22	*Sprayed.*—Lime-sulphur 1 : 60	Not sprayed
Oct. 6	*Mown.*—Air-dry hay 6cwts. 42lbs. = 1 ton 8cwts. 110lbs. p. ac. Estimated per cent. lucerne, 55·5%	*Not mown.*
Nov. 21–23	*Mown.*—Air-dry hay 2cwts. 71lbs. = 11cwts. 109lbs. p. ac. Estimated per cent. lucerne, 67·3%	*Mown.*—Air-dry hay 6cwts. 21lbs. = 1 ton 8cwts. 14lbs. p. ac. Estimated per cent. lucerne, 5·5% Samples of population of *S. viridis* taken from July 18th to Nov. 18th (*see* Fig. 3)

It is seen in Table I. that after July 15th to 17th the total yield of lucerne in the plots per acre was:—

Plot A	1 ton 15cwts. 52lbs.
Plot B	1 ton 7cwts. 99lbs.
Plot D	1 ton 16cwts. 89lbs.
Plot C	0 ton 1cwt. 61lbs.

The low yield in C is definitely associated with the infestation and the preferential feeding of the insects on the lucerne.

Samples of the population of *S. viridis* were taken every Tuesday and Friday, commencing April 26th. Three samples were taken on each of these days by means of iron cylinders 6½in. diameter and the insects counted (*vide* Davidson J. and Swan D. C. 1933, Bull. Entom. Res. vol. 24). The number of insects in three samples represented the population in an area of 0.7 sq. ft. From April 26th to July 15th the samples were taken from plot A. Owing to the density of the infestation in this plot, the growth of the lucerne was almost completely checked, and it was necessary to transfer to plot C after July 15th, from which the remaining samples were taken (July 18th to November 18th).

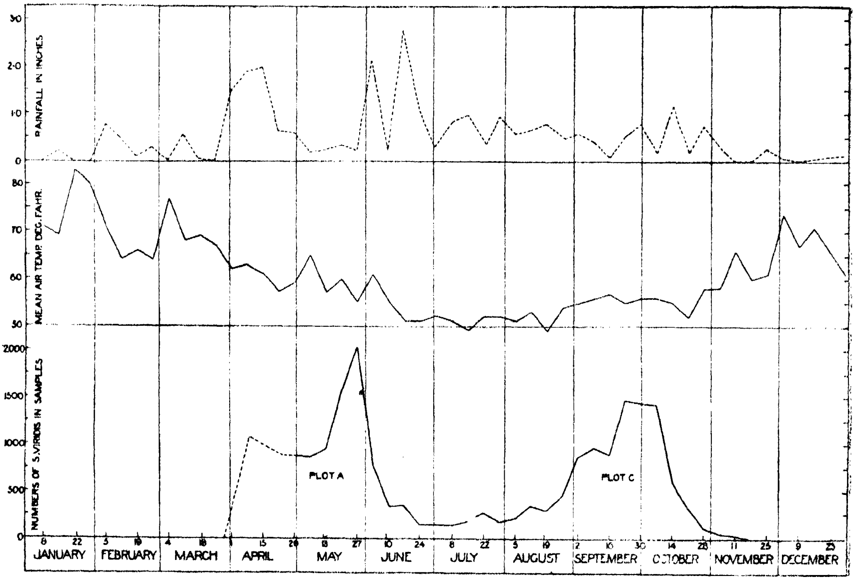

Fig. 3.—Showing the numbers of *S. viridis* each week in plots A and C during 1932. The points on the population curve represent the number of individuals each week in an area 0.7 sq. ft. (average for the two days each week on which samples were taken). The mean air temperature and the total rainfall each week are also shown.

The progress of the population each week is shown in Fig. 3, together with the total rainfall and mean air temperature each week during 1932. The diagram shows that the active stage of the insect is restricted to the wet season. It also shows the two periods in autumn and spring, which are more favorable for increase of the population, due to favorable temperatures and moisture conditions on the soil surface. There is a depression in the population during the cold, wet period of July and August, which is more pronounced in this instance owing to the poor growth of the lucerne. These observations are associated with the effect of the meteorological conditions at the Waite Institute during 1932. These conditions will vary with the season and with the locality; with favorable temperature and moisture on the soil surface (not persistently saturated) decrease in the population will not be so evident.

IV.—EFFECT OF THE TREATMENT OF THE PLOTS.

The treatment which each plot received is given in Table I. It was necessary in order to obtain samples of the population of *S. viridis,* to allow the infestation to proceed unchecked in plot A until July 22nd and in plot C from July 17th onwards. Owing to the proximity of these infested plots, certain insects passed over to adjoining plots, although this was restricted to a large extent by treatment of the surrounding lucerne.

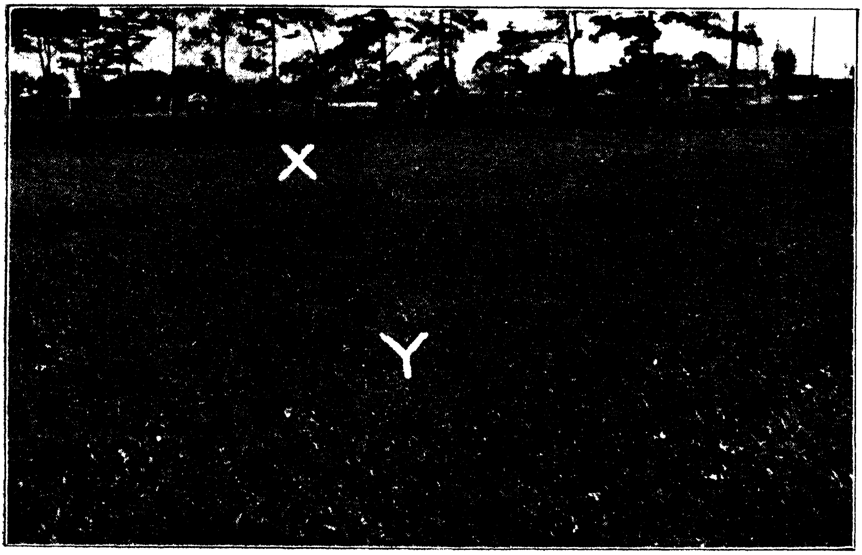

Fig. 4.—Showing the condition of the lucerne in sections X and Y on June 21st, 1932. (For details see text).

The effect of the treatment of the different plots is reflected in the yields of hay and the percentage of lucerne present. The appearance of both section X (plots A D) and section Y (plots B C) on June 21st, 1932, is shown in Fig. 4. Section Y is the better stand, due, to some extent, to a lighter infestation than section X, but essentially to the effect of spraying with lime-sulphur on May 6th.‡ The whitish appearance of section X shows the severity of the infestation, which is also reflected in the yield of plot B on July 15th compared with plot A (Table I.).

The improvement in plots A and D after spraying with lime-sulphur on July 22nd. is reflected in the subsequent yields. This is also the case with plot B compared with plot C. In the latter plot the insects almost completely checked the growth of lucerne, which resulted in a heavy growth of annual grasses and weeds which are unfavorable food-plants for the insects; the hay cut on November 21st from plot C was estimated to contain only 5.5 per cent. lucerne; the condition of the plots on November 17th is shown in Fig. 5; plot C is a wilderness of wild grasses and annual weeds; plot B is a fair stand of lucerne with some weeds present and plot D is a clean stand of lucerne.

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‡ Lime-sulphur was used by H. M. Nichols against *S. viridis* in Tasmania (*Tasm. Journ. Agric.* 1930, p. 117.)

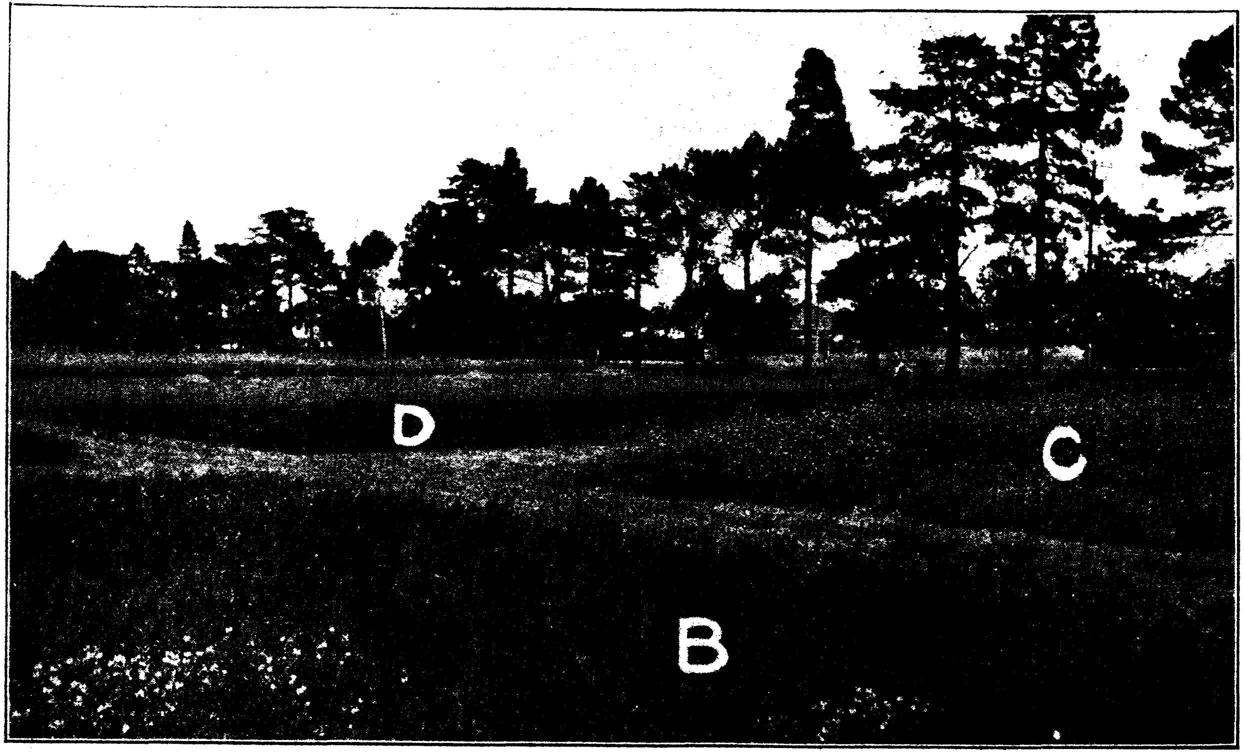

Fig. 5.—Showing the condition of the lucerne in section X (plot D) and section Y (plots B and C) on November 17th, 1932. (For details see text).

It would appear that by mowing plots A, B, and D on October 6th, at a time when the lucerne was making vigorous growth, the growth of annual grasses and weeds was checked and the numbers of *Sminthurus* reduced by exposure to dry conditions.

The results of this experiment show, that by timing the mowing and spraying of lucerne in relation to the habits of the insect, effective control may be economically obtained. The dates of treatment will vary with the season and with the locality. It is necessary to ensure freedom of the treated crop from invasion from the surrounding areas. A clean fallow surround, at least half a chain wide, will assist in this respect, but its efficiency will depend on the degree of infestation of the surrounding area. Where an infested lucerne area is extensive, it may be impracticable to treat the whole area at the same time. If treated in sections, measures should be taken to prevent the migration of the insects between treated and untreated sections. The spraying should be thorough and carried out at the proper time after mowing, otherwise many insects will escape to neighboring sections. The possibility of planting buffer sections of suitable pasture grasses, unfavorable for the insect, may be worthy of investigation in the case of large areas of lucerne pasture.

The aim of the treatment and management of lucerne pasture as indicated above is to reduce the numbers of the insects at the critical periods. Treatment may be necessary each year, but on economic grounds it seems it may be well worth while.

Some lucerne pastures may have become so heavily and permanently infested with the insect, that more drastic treatment may be necessary in order to bring such pastures into a normal condition as regards the population of the lucerne flea. More frequent spraying will be necessary for one or two seasons.

Lucerne may flourish in an area of relatively low rainfall if underground water is favorable. Such an area may be climatically unsuitable for increase of the population of *S. viridis,* owing to the dry conditions on the soil surface. The districts bordering on the River Murray, from Murray Bridge northwards, are normally unsuitable for increase of the population of lucerne flea, owing to the relatively low rainfall and the character of the soil. On the reclaimed swamp lands, however, the conditions are favorable owing to artificial irrigation and the high water holding capacity of the soil.

The number of consecutive months in which rainfall exceeds evaporation, thereby ensuring suitable moisture conditions on the soil surface, is the chief factor determining the distribution and abundance of *S. viridis* in South Australia. Temperature in association with these conditions affects the rate of multiplication of the insects. For example, with a mean temperature of 52° F., the complete life cycle, from the time the egg is laid until the insect hatching from it becomes adult, takes about 10 weeks. With a mean temperature of 60° F., it takes about six weeks. With persistent rains and low evaporation, resulting in extreme wetness at the soil surface, accompanied by low temperatures, the conditions are unfavorable for its increase in numbers. Under these conditions a loose, open soil is more favorable for the insects than a heavy clay soil.

Some experiments have been made with a hopperdozer drawn through the crop, as a means of reducing the number of the insects. These experiments are being continued with a view to developing an inexpensive and efficient model which may be suitable for this purpose.

The control of the insect in subterranean clover pastures is also being investigated. This aspect of the problem is somewhat different from that of lucerne, owing largely to the character of the areas concerned. It is possible that a chain or brush harrow used on heavily infested portions of the pasture early in the season may give temporary relief by destroying numbers of the insects.

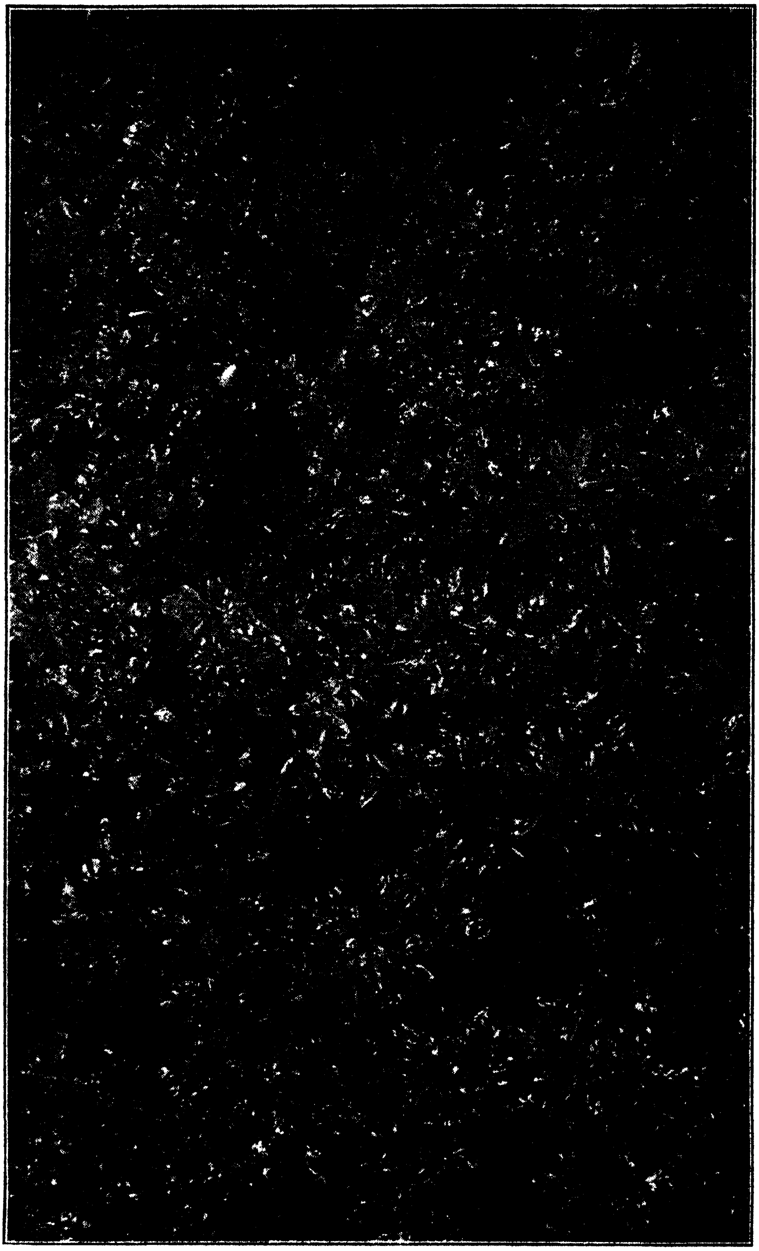

Fig. 6.—Lucerne (var. Hairy Peruvian) showing less damage by *S. viridis* early in the autumn compared with Fig. 7. Photo. May 30th, 1931.

V.—VARIETIES OF LUCERNE IN RELATION TO INFESTATION.

Of nine varieties of lucerne which were tested in small plots, all were more or less attacked by *S. viridis*. The variety Hairy Peruvian, owing to its upright habit during early growth, generally suffers less than other varieties early in the season, but becomes attacked later in the season as the population of the insect increases. In the early part of the rainy season, the insects feed preferably on the plants nearer to the ground where the humidity is more favorable for them. As the season advances and the relative humidity of the air increases, the insects feed more readily on leaves well above the soil surface. This appears to be the reason why the variety Hairy Peruvian is not so severely attacked in the early part of the season. In Fig. 6 the condition of this variety on May 30th, 1931, is shown and in Fig. 5 the condition of the variety Hunter River growing in a neighboring plot is given for comparison. The latter was more severely attacked, but the former was extensively damaged by the end of June.

VI.—EFFECT OF SUMMER IRRIGATION ON *S. VIRIDIS* IN LUCERNE.

It is the lack of suitable moisture owing to the low rainfall, high temperatures, and dryness of the air during the summer months, which inhibits the development and hatching of the eggs of *S. viridis* and prevents the occurrence of the active insects. The falls of rain are normally too light and infrequent during this period to maintain a favorable moist condition of the surface soil for more than a day or so. If a suitable soil moisture is maintained for a sufficiently long period, the eggs will develop and some may hatch, but the insects will not survive the subsequent hot, dry conditions.

With lucerne on irrigated areas on the River Murray, the intervals between irrigations may be several weeks and the surface of the soil normally dries out within a few days after irrigation. Therefore the moisture is not retained at the surface sufficiently long to ensure general hatching, but during cool periods some insects may hatch out. If the surface soil is maintained suitably moist during the summer months for about three weeks, by frequent irrigations, the eggs may be induced to develop. Some of the embryos will be killed owing to the high temperatures, and the development of those insects which hatch out will be adversely affected for the same reason. The humidity of the air in the lucerne may allow certain of them to survive, but they may be readily killed off by cutting the crop, thereby exposing them to dry conditions. With an open soil, however, many insects will penetrate into crevices where the moisture is favorable.

This is shown in the following experiment. Two plots of Hunter River lucerne (9yds. x 6yds.), at the Waite Institute, were irrigated in January, 1931. Plot A was watered from a hose pipe on alternate days from January 11th to 25th, the amount of water applied being roughly equivalent to 3in. of rain. Plot B was watered daily from January 11th to February 9th, with the equivalent of roughly 6in. of rain; neighboring plots were not irrigated.

Feeding marks were observed on the plants early in February in both irrigated plots, particularly on plot B, and several young *S. viridis* were present by February 12th. The lucerne was cut on February 16th and the insects died out during the next few days.

On the non-irrigated plots no insects were present until the normal, general hatching of the over-summering eggs commenced in the second week in April, following on the autumn rains. By April 27th the insects were present in fair numbers in these plots and by May 30th the lucerne was severely damaged (Fig. 7).

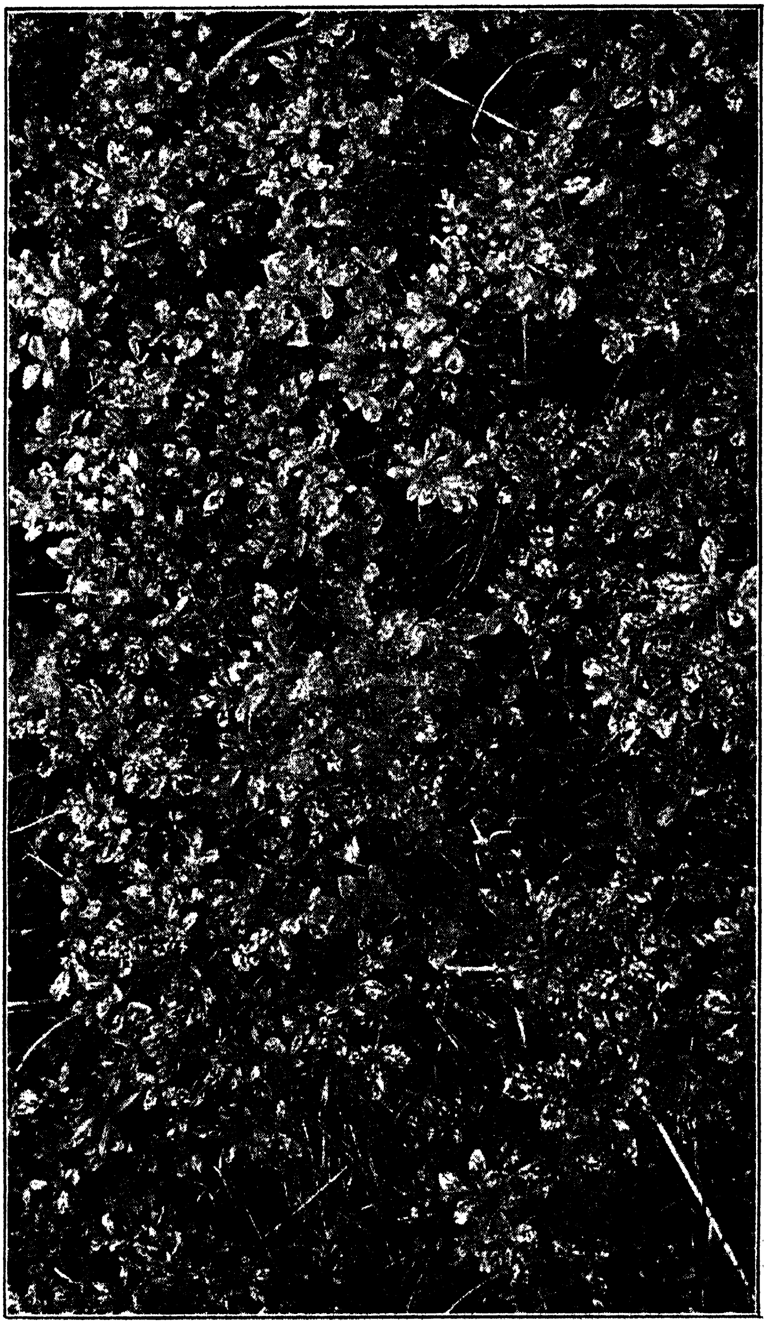

Fig. 7.—Lucerne (var. Hunter River) showing damage by *S. viridis* early in the autumn. Photo. May 30th, 1931.

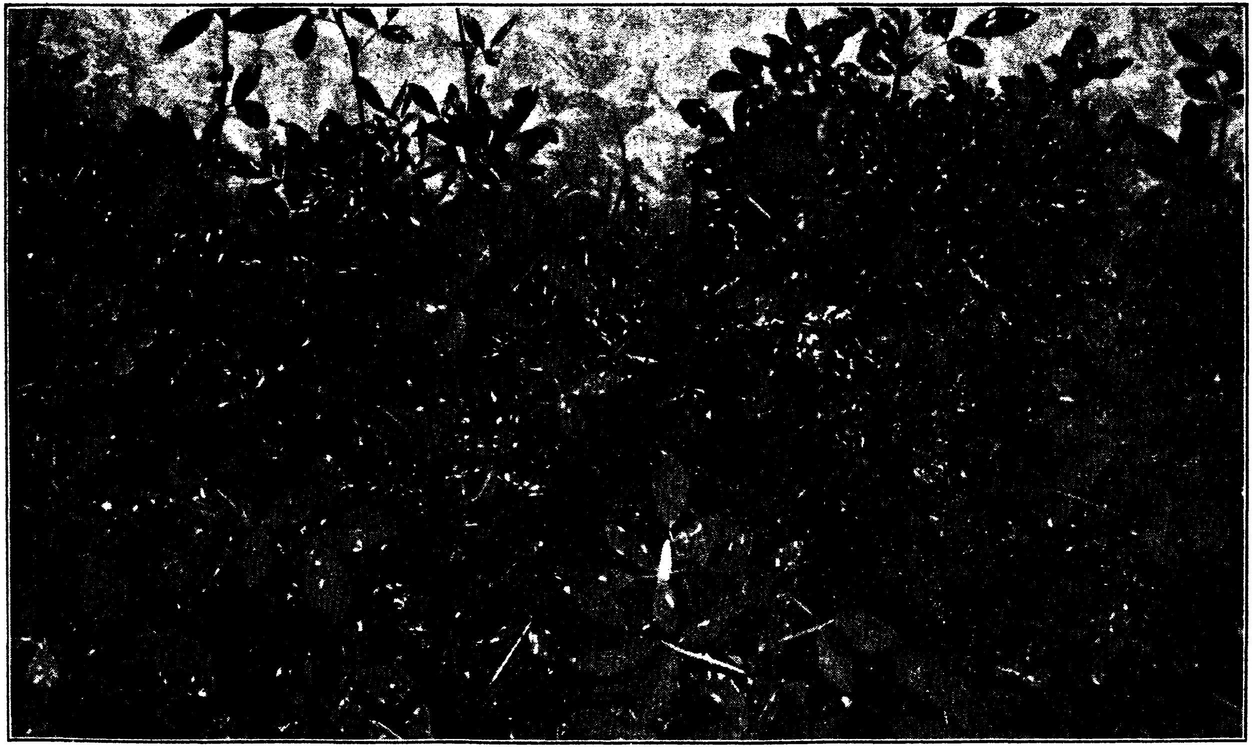

Fig. 8.—Lucerne (var. Hunter River) irrigated daily from January 14th to February 11th, 1931. Note increase in growth and small damage by *S. viridis* compared with Fig 7 (not irrigated). Photo. May 30th, 1931.

On plot B only a few isolated individuals were present at the end of May. The plots were protected from invasion from the neighboring plots by a border of sheet iron 15in. high. A few individuals, however, may have been carried into them when observations were being made, or by wind, as the division between the plots was only about 2 feet. The number of ***Sminthurus*** in plot A was greater than in plot B, but compared with the non-irrigated plots the numbers were very small. The lucerne had made considerable growth on plots A and B, due to the more favorable moisture content of the subsoil as a result of the summer irrigation.

The condition of plot B on May 30th is shown in Fig. 8, which should be compared with the non-irrigated plot (Fig. 7).

It was evident, however, that the treatment of plot B had induced development and hatching of the over-summering eggs in February, so that when normal hatching occurred in April, there were few viable eggs in the plot to hatch out. This was also the case with plot A, although the irrigation in this plot was not as efficient in this respect as in plot B. Frequent irrigations are necessary in order to maintain suitable moisture in the surface soil. With irrigated swamp soils this may be impracticable owing to the danger of water logging causing the death of the lucerne plants.

VII.—CONCLUSIONS REGARDING CONTROL MEASURES.

The conclusions regarding control measures to be drawn from the observations described in the previous pages may be summarised as follows:—

(1) Close graze or cut the crop three to four weeks after the over-summering eggs of *S. viridis* commence to hatch in the autumn and spray thoroughly with lime-sulphur at strength 1gall. in 60galls. of water, at the rate of 80galls. to 100galls. per acre, using a good pressure (about 200lbs.). This will reduce the number of insects in the first generation before eggs have been laid.

(2) The number of subsequent sprayings will depend upon the degree of infestation in the crop. In all cases the lucerne should be close grazed or mown before spraying so that the insects are fully exposed to the spray. During certain months of the winter, lucerne will make slow growth in most districts and the damage to the crop may be heavy with smaller numbers of insects.

(3) When the lucerne commences to make vigorous growth in early spring (about August) close graze or mow the crop and spray again.

(4) By mowing the crop about the end of September, preferably during a dry, warm spell of weather, the growth of annual weeds will be checked and by exposing the soil surface, many insects will be killed by the dry conditions. This will reduce the number of over-summering eggs which are laid about this time and therefore reduce the numbers of insects which hatch out the following autumn.

(5) Safeguard the crop from invasion by the insect from outside areas. A clean fallow surround will assist in this respect if the infestation in the neighboring areas is not heavy.

(6) The timing of the treatment recommended above is important and the dates will vary somewhat in different seasons and in different localities.

(7) The aim should be to reduce the population of the insects at the critical periods and to favor the growth of lucerne in competition with the insects.

ACKNOWLEDGMENTS.

I am indebted to Mr. H. C. Trumble for the hay yields and percentage of lucerne in the plots. Mr. D. C. Swan took the samples of the population of *S. viridis* in the plots and made the counts of the insects in these samples. Thanks are also due to Mr. R. C. Scott, of the Department of Agriculture, who arranged for, and supervised, spraying experiments in certain districts on various occasions. Mr. Scott also gave me considerable assistance during my visits from time to time to lucerne growing disricts.

ROSEWORTHY AGRICULTURAL COLLEGE.

HARVEST RESULTS FROM EXPERIMENT PLOTS, 1932, AND REPORT OF MISCELLANEOUS EXPERIMENTS, 1928-32.

[By T. A. Cole, D.D.A., Experimentalist.]

The Season 1932.

Reference to the weather and rainfall details set out in the tables below indicates that the season of 1932 was particularly favorable for the production of cereal crops. In the first half of April over 3½in. of rain fell, and brought about a good germination of rubbish, but set the fallows down hard. A month, then, of almost rainless weather accentuated this trouble, and by mid-May the soil was dry and packed tight, and it became difficult to cultivate with certainty of killing the weeds which, by that time, were strongly established, particularly the soursobs. One inch of rain was received in the latter half of May, and, with the exception of two periods of four days each, rain fell on every day of June, thus delaying the seeding, and, in fact, making it impossible to sow the crops in good soil conditions. Too deep cultivation at this stage was probably responsible for the development of "take-all" disease later in the season. The seeding was completed early in July.

During the growing period to the end of October, rainfall was very abundant, and the crops grew tall and heavy. A prolific harvest was expected until during the spring "take-all" (haydie) and "rust" made their appearance, and developed with startling rapidity, and it became evident that yields were to suffer considerable reductions.

November was dry and cool, and the crops matured under good conditions for the filling of grain not affected by rust. The later maturing varieties were favored by the slow ripening period, and yielded accordingly well.

Thirteen frosts were recorded from June to October; these were an advantage in helping to check the bulky growth.

The total rainfall for the year amounted to 21.03in., or 3½in. above the mean of 29 years—17.52in. The registered "useful" rainfall, i.e., falling between April 1st and November 30th, was 17.28in., which amount is 82 per cent. of the total rain for the year.

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TABLE I.—*Showing the "Annual Rainfall" at Roseworthy College, together with the "Useful Rainfall," the Percentage of Useful to Total Rainfall, the Total "Fallow Rainfall," and the Means for the Seasons* 1904-32.

Year.	Total Rainfall.	" Useful " Rain, April 1st to Novem. 30th.	Percentage " Useful " to Total Rain.	" Fallow " Rain, Previous August 1st to March 31st.
	In.	In.	%	In.
1904	14·70	11·60	79	11·16
1905	16·71	14·23	85	7·18
1906	19·73	16·31	83	7·96
1907	15·13	13·96	92	11·29
1908	17·75	15·52	87	9·13
1909	24·05	21·15	88	9·51
1910	23·87	16·79	70	17·56
1911	13·68	9·45	69	11·41
1912	14·97	13·05	87	5·88
1913	15·66	10·82	69	13·00
1914	9·36	6·12	65	13·07
1915	19·76	18·33	93	3 86
1916	23·23	20·25	87	9·08
1917	21·86	17·25	79	14·79
1918	12·01	10·53	88	10·83
1919	12·38	8·21	66	7·45
1920	19·30	16·76	87	7·27
1921	17·16	12·98	76	13·78
1922	20·00	14·90	75	7·51
1923	27·46	25·30	92	9·32
1924	20·43	16·08	79	15·23
1925	15·65	14·18	91	11·48
1926	18·49	16·63	90	8·33
1927	14·59	11·73	80	11·08
1928	18·03	11·85	66	12·40
1929	13·06	9·73	75	5·22
1930	12·85	11·77	92	8·61
1931	15·18	13·47	89	9·33
1932	21·03	17·28	82	8·26
Means 29 years	17·52	14·35	81	10·03

TABLE II.—*Showing the Distribution of Rainfall by Months for the Seasons* 1928-32, *together with the Mean Fall for each Month of the Period* 1904-32.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
1928	1·58	3·29	1·10	0·80	2·01	3·30	1·55	0·52	1·31	2·22	0·14	0·21
1929	0·29	0·36	0·17	0·42	0·93	1·54	1·07	1·62	1·90	0·76	1·49	2·51
1930	0·02	0·30	0·01	0·89	0·74	0·77	2·50	2·06	1·01	3·21	0·59	0·75
1931	0·60	0·10	1·01	1·05	2·80	1·70	2·51	1·86	2·25	0·83	0·47	0·00
1932	0·34	1·24	1·27	3·73	1·91	3·83	1·73	1·95	1·29	2·73	0·11	0·90
Means, 1904-32	0·64	0·79	0·86	1·06	2·16	2·29	1·98	2·02	2·01	1·77	1·06	0·87

TABLE III.—*Showing Details of the Weather for* 1932.

Month.	Rain-fall.	No. of Days on which Rain Fell.	Important Rains.		Min. Temp.	Mean Min. Temp.	Frosts.		Max. Temp.	Mean Max. Temp.
			Date.	In.			Date.	Temp.		
	In.									
January .	0·34	2	9	0·34	49·7	62·4	—	—	111·0	90·9
February	1·24	12	5	0·83	45·4	55·1	—	—	92·8	78·0
March ..	1·27	11	27	0·46	40·8	56·4	—	—	101·8	81·1
			28	0·34						
April ...	3·73	17	1	0·34	41·8	53·4	—	—	76·0	67·8
			5	0·23						
			6	1·61						
			11	0·57						
			17	0·55						
May	1·91	9	18	0·52	39·4	49·4	—	—	80·1	67·9
			20	0·19						
			21	0·54						
			31	0·54						
June ...	3·83	22	1	0·59	32·7	44·2			67·0	58·6
			3	0·18						
			11	0·52						
			12	0·60			27	31·9		
			16	0·21			29	29·8		
			17	0·23			30	26·1		
			20	0·13						
			23	0·26						
			24	0·47						
			25	0·20						
July	1·73	21	3	0·21	32·6	42·8	1	26·8	63·3	57·5
			14	0·21			7	31·0		
			21	0·17			8	30·8		
			25	0·22			9	31·2		
			30	0·18			12	29·2		
August .	1·95	21	7	0·20	34·6	43·8			73·9	59·3
			12	0·45			2	31·2		
			25	0·17			15	31·2		
			29	0·21			17	29·8		
			30	0·19			20	31·6		
September	1·29	15	4	0·26	37·1	45·6	—	—	75·6	65·2
			14	0·15						
			18	0·19						
			29	0·43						
October .	2·73	14	12	1·35	34·2	45·3	17	32·0	82·0	65·3
			22	0·41						
			25	0·15						
			26	0·39						
November	0·11	7	—	—	37·8	51·1	—	—	100·6	78·4
December	0·90	9	15	0·41	41·8	54·3	—	—	102·0	79·8
			23	0·16						
			25	0·20						

The following results are included in this report:—

Variety Multiplication Plots of Wheat, Oats, and Barley, 1932
Variety Trial Experiments with Wheat, Oats, and Barley, 1928-32.
Time of Seeding Experiment with Wheat, 1928-32.
Rate of Seeding Experiment with Wheat, 1928-32.

VARIETY MULTIPLICATION PLOTS, 1932.

Wheat.—Many varieties are grown from year to year for multiplication purposes, and subsequent distribution. The yields obtained from such plots in 1932 are recorded below, and are of interest, though not strictly comparable, as the soil treatments were not necessarily similar for all; for example, each variety was sown according to the maturity class into which it falls, and no attempt was made to seed all on uniform soil, which is desirable where yields are to be used for making comparisons. The table is set out in two parts—A, giving the yields of varieties, and B, the yields of unnamed crossbreds.

TABLE IV.—*Showing the Yields of Wheat from Varieties Grown for Multiplication Purposes,* 1932.

PART A.						PART B.		
Variety.	Yield per Acre.		Variety.	Yield per Acre.		Unnamed Crossbred.	Yield per Acre.	
	B.	L.		B.	L.		B.	L.
Sword	37	32	Kington	19	35			
Nabawa	34	59	Collection	19	19	Dan x Baroota Wonder	26	30
Forel	31	52	Gallipoli	18	54	Nabawa x Bunyip	26	26
Dawn	28	58	Dalton	18	22	Nabawa x Gluyas (1)	25	17
Felix	28	38	Canberra	17	28	Nabawa x Hurst (2)	24	43
Waratah	27	14	Currawa	17	7	Sultan x Nabawa	24	43
Daphne	23	3	Regent	17	4	Nabawa x Gluyas (2)	24	8
Florence	24	39	Caliph	14	21	Caliph x Baroota Wonder	17	30
Major (selection)	24	9	D.G.H.	13	12			
Faun	23	30	President	13	3	Sultan x Zealand Blue	12	12
Dan	21	56	King's White	11	40			
Nawab	21	46	Sirdar	10	56			
Ford	21	28	Federation	10	53			
Danly	20	50	Gluyas	10	13			
Bordan	20	47	Caird	8	51			
White Essex	20	20						

Variety Sword takes a leading position with a yield of 37bush. per acre. Throughout the growing period the plot was very attractive, and withstood the rust and take-all diseases which occurred in the spring. Nabawa was well suited by the favorable season, and was expected to give a yield equal to that of Sword. It did not finish off as well, however, and finally yielded 35bush.

The effect of rust on the various varieties is, on the whole, well demonstrated by the order of their yields in the table. Such varieties as Caird, Caliph, Federation, King's White, &c., were badly affected, while those at the head of the list showed some resistance to the disease.

The grain of many of the "unnamed crossbreds" which appear in part "B" of the table is sufficiently multiplied to be included in variety trials in the coming season. Though the yields of some are really good, the position is not definite in the absence of test results. The Nabawa crosses, which were made for flag smut resistance, are the most promising at this stage. While not showing immunity to flag smut, their record in the breeding and disease resistance rows suggests that they will be of value.

Oats.—The oat varieties in this series of multiplication plots have given very indifferent yields this year. They were seeded in dry soil, and soursobs caused a poor survival of plants, and the yields were seriously affected.

TABLE V.—*Showing the Yields of Varieties of Oats Grown for Multiplication Purposes,* 1932.

Variety.	Yield per Acre.	
	B.	L.
Early Kherson	41	28
Algerian	35	36
New Zealand Cape	26	23
Sunrise	22	19
Smyrna	20	38
Guyra	17	32
Palestine	17	17
Early Burt	16	7
Warrigul	8	23

Early Kherson and Algerian varieties were able to compete with the soursobs, and gave quite good yields of 41bush. and 35bush. respectively. However, all the varieties were affected to a varying degree, and hence, the figures shown can only represent a record of the yields harvested.

Barley.—Three varieties of barley were grown, and the yields harvested are shown in the next table.

TABLE VI.—*Showing the Yields of Varieties of Barley Grown in the Multiplication Plots,* 1932.

Variety.	Yield per Acre.	
	B.	L.
Roseworthy Oregon	42	6
Shorthead	40	22
Prior	28	24

The season was conducive to the production of a plump sample of barley, for the ripening period was cool and slow, no hot withering spells being experienced. The malting type, Prior, matured with an excellent golden color, but its yield was somewhat diminished because part of the plot was seeded in wet soil; a crust formed afterwards, and retarded the development of the young growth. Roseworthy Oregon and Shorthead benefited by the wet season and produced good yields.

THE VARIETY TRIALS AT ROSEWORTHY AGRICULTURAL COLLEGE, 1928-32.

Wheat.—The variety yield trial of popular wheats was initiated to establish a group of varieties which could be said to suit local conditions, and the conditions of other similar dry districts of the State. About 250 varieties of wheat are grown in South Australia annually, and as this number seemed to be far in excess of the requirements of this State, even with its wide range of soil and climatic conditions, about 50 of the most popular kinds were collected together for comparison. In addition, several College crossbreds were included in the test from time to time, until, in one year, 75 varieties were grown.

The work was commenced in 1928. The varieties were sown in triplicated randomized plots in order to minimise experimental errors due to changes in soil fertility. The aim was to carry out the trial under field conditions of drilling, binding, and stripping. Each plot occupied about one-tenth of an acre, so that each variety, being sown in triplicate, approximated in area to three-tenths of an acre. Narrow divisions separated neighboring plots; this had the effect of inducing vigorous border growth, which was eliminated from the yield results by cutting off a strip 2ft. wide from the sides and ends of each plot.

The hay yield was obtained by taking a full cut with a 6ft. reaper and binder from the long side of each plot, and the remaining portion was stripped to obtain the grain yield. Thus each plot provided approximately one-fortieth of an acre for a hay yield, and one-sixteenth of an acre for a grain yield.

When the trial had been in progress for three years (1928-30) it became apparent that many of the varieties were quite unsuitable types, and the number included in the trial was reduced to 42 varieties in the 1931 seeding, and again to 34 varieties in the 1932 seeding. Those discarded as not being worthy of more than three years of trial are contained in the following list:—Baroota Wonder, Baldmin, Begum, Bordan, Caird, Canaan, Captain, Cowhort, Dawn, Daphne, Forel, Faun, Fay, Finch, Federation, Gloss, German Wonder, Glede, Indcret, Joffre, Major, Minister, Mac's White, Maharajah, Marshall's No. 3B, Nizam, Onas, Rajah, Regal, Satisfaction, Sepoy, Turvey, Triumph, Walker's Wonder, Wannon, Wardfir, Yilma, Yandilla King, Zealand Blue.

Many of these are well known wheats which have a value under certain conditions, while others are relatively recent introductions. All have failed, however, to show results that compare favorably with the 30 odd varieties that have been carried through the five seasons in the trial plots. It is essential that a variety should possess a high degree of hardiness and be able to mature good grain under early dry and hot conditions, to be of value in districts subject to partial droughts. It has been noteworthy that, on the average, better grain has been produced in the dry seasons than in the wet, by the earlier hardy wheats; but higher yields have, of course, been harvested in the wet seasons.

After five seasons, including three of partial drought and two good years, reliable comparable mean yields are available.

Note on the Seasons.

1928 was an unfavorable year. The season opened with good rains in May following heavy summer falls. Continued rain in June caused a protracted seeding which was concluded early in July. July, August, and September showed only half their average rainfall, August being almost rainless. October rainfall was good, but there were no finishing rains in November, and yields were generally poor.

1929 was the second unfavorable season occurring during the trial. There were actually no really soaking rains till December, and the rain received during the growing period was 5in. below the average.

1930 was the third consecutive year of dry conditions, though it was an improvement on the preceding two years. There was a marked scarcity of seeding rains till the end of June, and consequently a late seeding was inevitable. Twelve frosts occurred during June, July was very wet, September and October very dry, only light showers which favored a mild rust attack fell. Strong gales in November caused some shedding of grain.

1931 was a very good season. A high "useful" rainfall of good distribution was recorded. The season opened well at the end of April, and, apart from a cold spell in July, conditions for growth were excellent until October, which with November was rather dry, whereas some good falls were necessary during these latter months to enable the heavy, flaggy growth to finish the maturing of the grain under good conditions. Harvest conditions were good.

1932 was a good year, though the end of the season was marred by the bad attacks of take-all and rust, which resulted in diminished yields, and a poor sample of grain. The season opened in good time for seeding, but a wet June caused a late finish. Excellent growth occurred until the rust and take-all appeared. A good slow ripening period well filled the grain of varieties resistant to rust.

Wheat Grain.—While the years 1928, 1929, 1930 were dry, and the yields harvested were low, it was in these years that the hardier types of wheat proved their superiority best in 1931 and 1932, which were, by comparison, good years, the later slower maturing types with much less drought resistance and consequently much more suitable for growing in more favorable conditions, were able to compete successfully with the earlier wheats.

In two seasons (1930 and 1932) rust was responsible for some low yields. For example, Caliph, in the latter year, produced a very shrivelled sample of grain which was matured on straw prematurely rotted by the rust.

The yields of the wheats that have been under trial during the whole of the five years are shown in the following table, wherein the varietal means are set out as percentages of the yield of Gluyas, which is taken as a standard for comparisons, and is stated at 100 per cent.

TABLE I.—*Showing the Grain Yields of Varieties of Wheat Grown on the "Variety Trial,"* 1928-32.

Variety.	1928.		1929.		1930.		1931.		1932.		Mean 5 Years, 1928-32.		Percentage.
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	
Nawab	25	25	15	2	15	15	29	1	25	18	22	0	117·3
Sword	28	51	16	27	16	16	21	30	27	37	21	30	114·7
Florence ...	23	15	11	13	16	34	23	52	24	19	19	51	105·9
Gluford ...	24	9	13	11	12	49	19	20	27	12	19	20	103·1
Regent	23	42	13	28	14	8	22	44	21	39	19	8	102·0
Waratah ..	22	25	16	40	12	49	23	46	19	13	18	59	101·0
Gluyas.....	23	52	16	48	14	19	22	7	16	41	18	45	100·0
Nabawa ...	22	9	12	58	12	19	19	2	24	46	18	15	97·3
King's White	19	47	17	23	11	2	27	16	15	18	18	9	96·8
Currawa ...	19	43	13	58	14	32	17	23	25	10	18	9	96·8
Canberra ..	19	47	13	32	15	3	25	25	16	27	18	3	96·3
Felix	19	23	14	2	14	26	22	13	19	32	17	55	95·6
Gallipoli ...	18	53	10	20	12	7	19	26	24	36	17	4	91·0
Sultan	21	6	17	31	9	23	23	15	13	54	17	2	90·8
Dan	18	5	15	2	10	24	19	8	21	53	16	54	90·1
Sirdar	21	13	13	53	11	6	20	10	16	15	16	31	88·1
President ..	18	16	17	45	8	35	22	50	14	13	16	20	87·1
Ford	19	3	15	23	7	22	17	48	20	42	16	16	86·8
Crostan ...	19	5	16	32	6	46	17	11	19	19	15	47	84·2
Late Gluyas	20	16	13	27	10	30	15	13	18	55	15	40	83·6
Caliph	20	50	14	45	9	23	22	26	9	59	15	26	82·3
White Essex	16	43	12	45	8	4	14	30	24	57	15	24	82·1
Leak's Rust Proof	16	2	13	54	7	40	12	15	22	38	14	16	76·1

One of the objects of the trial is to provide a means of testing the worth of new varieties produced either locally or elsewhere. There have been, therefore, introductions of wheats from year to year, and the following tables show the yields of those varieties that have been included in the last three and two years respectively, together with the yield of Gluyas, over the same period, for comparative purposes.

TABLE II.—*Showing the Grain Yields of Varieties of Wheat Introduced into the "Variety Trial" in* 1930, *and continued to* 1932.

Variety.	1930.		1931.		1932.		Mean 3 Years.		Percentage.
	B.	L.	B.	L.	B.	L.	B.	L.	
Collection	12	7	18	31	25	14	18	37	105·2
Danly	11	0	20	22	21	59	17	47	100·5
Gluyas.........................	14	19	22	7	16	41	17	42	100·0
Kington	11	31	20	53	18	53	17	6	96·6
Noongaar	15	27	19	58	13	42	16	22	92·5
Sulland	10	54	17	5	10	56	12	58	73·3

TABLE III.—*Showing the Grain Yields of Varieties of Wheat Introduced into the "Variety Trial" in* 1931, *and continued in* 1932.

Variety.	1931.		1932.		Mean 2 Years.		Percentage.
	B.	L.	B.	L.	B.	L.	
Dalton	24	41	19	33	22	7	114·0
Gluclub	20	35	21	46	21	11	109·2
Gluyas	22	7	16	41	19	24	100·0
Improved Gluyas	18	13	14	59	16	36	85·6

While it is not considered that the results of the three and two years of trial are sufficient to permit a true estimate of their value, they do indicate which of the new varieties are worthy of consideration for further tests. It is intended, in the future, to use this experiment mainly for testing out new production and introductions by comparison with such standard varieties as Gluyas, Nabawa, Ford, &c.

A perusal of Table I. brings out some interesting points. The variety Nawab has given the highest mean yield, which is 17 per cent. above that of Gluyas. It is a derivative mainly of King's White, and its high position is largely due to the phenomenal yield obtained in 1931. Nawab is disease liable, but has nevertheless yielded well. Sword wheat has yielded consistently, and occupies the second position. It is far hardier and more disease resistant than Nawab. Efforts are being made to eliminate its tendency to throw a few brown chaff and purple straw types. Florence, Gluford, Regent, and Waratah are each ahead of the standard, Gluyas, in mean yield, while Nabawa, King's White, Currawa, Canberra, and Felix show mean yields slightly lower. An examination of the individual results has revealed that mean yields within 5 per cent. limits are significant. The suitability of the varieties for grain in conditions similar to those experienced at Roseworthy can be shown, therefore, by grouping as follows:—

Order of Suitability for 12in. to 18in. Rainfall.	Early Maturing Varieties.	Midseason Maturing Varieties.
1	Sword	Nawab
2	Florence	Ford (assumption)
3	Gluford Regent Waratah Gluyas King's White Canberra	Nabawa Currawa Felix
4	Sultan	Gallipoli Dan

It was expected that variety Ford, which has been so prominent for many years, particularly as a disease resister, would be well to the fore in the results. It is necessary to state that, unfortunately, a strain of Ford, which eventually proved in 1930 and 1932 to be not resistant to rust, was used in this trial. Thus it suffered in grain yield, though perhaps little in hay yield. The strain excludes itself from further use by reason of its low position in the list of mean yields and its susceptibility to rust.

A glance at Tables II. and III. shows that Collection, Danly, Kington, and Dalton—four new varieties—are worthy of further consideration, as their mean yields are within the limits of significance. The results from Gluclub are good, but the grain quality of this variety is so low that it is inadvisable that it be grown.

Wheaten Hay.—The next tables show the corresponding hay yields of the same varieties of wheat as were given in the grain lists.

TABLE IV.—*Showing the Hay Yields of Varieties of Wheat Grown in the "Variety Trial,"* 1928-32.

Variety.	1928.			1929.			1930.			1931.			1932.			Mean Five Years.			Percentage.
	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	
Sirdar	1	19	8	1	2	88	1	15	37	3	5	67	3	1	87	2	4	102	106·7
Crostan	2	9	68	1	2	75	1	6	88	3	5	12	2	18	101	2	4	69	106·0
White Essex	2	10	19	0	18	85	1	9	42	2	18	73	3	4	84	2	4	37	105·3
Leak's Rust Proof	2	7	101	1	0	42	1	9	71	2	19	17	3	1	64	2	3	81	103·9
Currawa ...	2	7	89	0	19	59	1	7	77	2	16	103	3	0	38	2	2	51	101·1
Ford	2	9	43	1	0	94	1	7	34	2	19	45	2	13	52	2	2	9	100·0
Nawab	2	1	76	0	17	96	1	6	30	3	5	109	2	16	50	2	1	70	98·9
Gluyas	2	6	61	1	0	81	1	9	27	2	15	48	2	16	12	2	1	68	98·8
Sword	2	7	38	0	18	74	1	4	109	2	16	89	3	0	72	2	1	66	98·8
King's White	2	1	38	1	2	49	1	11	6	3	1	29	2	11	93	2	1	65	98·8
Felix	2	1	29	0	16	16	1	6	59	3	4	68	2	15	9	2	1	14	98·7
Sultan	2	3	42	1	0	26	1	6	16	2	18	46	2	13	53	2	0	36	95·8
President ..	2	7	13	0	16	3	1	6	15	3	2	14	2	7	8	2	0	3	95·1
Waratah ...	1	14	35	1	1	7	1	6	45	2	18	87	2	16	50	1	19	45	93·6
Caliph	2	2	27	0	17	32	1	7	63	2	18	32	2	9	40	1	18	106	92·6
Regent	1	16	78	0	16	49	1	10	2	2	16	89	2	14	55	1	18	99	92·4
Dan	1	12	6	1	0	29	1	6	102	2	17	19	2	14	101	1	18	29	90·9
Canberra ..	1	18	69	0	17	74	1	5	12	2	18	73	2	9	110	1	18	0	90·3
Nabawa ...	1	17	93	0	15	12	1	8	23	2	15	7	2	13	64	1	17	107	90·0
Late Gluyas	1	14	23	0	19	66	1	9	42	2	14	35	2	10	43	1	17	64	89·3
Gluford	2	2	27	0	17	6	1	3	62	2	7	83	2	16	50	1	17	46	88·9
Florence ...	2	0	74	0	14	38	1	4	8	2	12	65	2	10	90	1	16	55	86·7
Gallipoli ...	2	1	25	0	13	44	1	3	105	2	11	66	2	11	86	1	16	43	86·5

TABLE V.—*Showing the Hay Yields of Varieties of Wheat Introduced into the "Variety Trial" in* 1930 *and continued to* 1932.

Variety.	1930.			1931.			1932.			Mean, Three Years.			Percentage.
	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	
Danly	1	6	74	2	16	89	3	1	53	2	8	35	101·3
Ford	1	7	34	2	19	45	2	13	52	2	6	81	100·0
Kington	1	6	102	2	18	18	2	16	84	2	7	31	99·3
Sulland	1	7	48	3	0	58	2	8	38	2	5	48	95·5
Collection	1	4	22	2	14	105	2	17	6	2	5	44	95·4
Noongaar	1	1	39	1	17	78	1	15	68	1	11	62	66·3

TABLE VI.—*Showing the Hay Yields of Varieties of Wheat Introduced into the "Variety Trial" in* 1931 *and continued in* 1932.

Variety.	1931.			1932.			Mean, Two Years.			Percentage.
	T.	C.	L.	T.	C.	L.	T.	C.	L.	
Dalton	2	19	31	2	17	41	2	18	36	103·3
Ford	2	19	45	2	13	52	2	16	49	100·0
Improved Gluyas	2	8	82	2	15	47	2	12	9	92·3
Gluclub	2	11	94	2	10	66	2	11	24	90·7

Among the new varieties shown in Tables V. and VI. there are not any which are likely to prove better than Ford for hay purposes.

Dual Purpose Wheats.—In general, it is desirable that wheat grown for hay should also be capable of yielding well for grain. Having this in view, the following list shows dual purpose varieties:—Sword, Ford, King's White, Felix, Crostan, Gluyas, Nawab, Sultan, and the new varieties Dalton and Danly.

Oats.—A trial similarly laid out was commenced in the same year, 1928, for varieties of oats—numbering 17. As with wheat, certain varieties were not continued after the third year because of their unsuitability for local conditions, until in 1932, nine varieties were grown. Those eliminated were Kelsalls, Kherson, Lachlan, Yarran, Calcutta, Imbros Island, Scotch Grey, and a College unnamed crossbred (Sunrise x Mulga).

The tables below show the grain and hay yields harvested each year, the means of five years expressed in bushels, and as percentages of the yield of Algerian, which is the standard variety used.

TABLE VII.—*Showing the Grain Yields of Varieties of Oats Grown in the "Variety Trial," 1928-32.*

Variety.	1928.		1929.		1930.		1931.		1932.		Mean 5 Years.		Percentage.
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	
Early Kherson	45	28	27	36	25	2	35	26	34	23	33	31	116·2
Palestine ..	46	4	28	21	22	1	46	24	19	35	32	25	112·2
Early Burt.	47	3	25	39	26	4	31	26	29	7	32	0	110·1
Smyrna ...	31	29	22	37	33	17	35	14	27	9	30	5	103·6
Warrigal ..	47	18	18	30	26	10	30	10	25	1	29	22	101·6
Guyra	30	37	27	30	29	37	27	0	31	23	29	17	101·2
Algerian ...	29	0	26	12	25	17	22	9	42	15	29	3	100·0
Sunrise	52	0	18	24	16	12	18	14	39	27	28	39	99·7
New Zealand Cape	26	1	26	18	23	23	19	12	31	7	25	12	87·0

TABLE VIII.—*Showing the Hay Yields of Varieties of Oats Grown in the "Variety Trial," 1928-32.*

Variety.	1928.			1929.			1930.			1931.			1932.			Mean 5 Years.			Percentage.
	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	T.	C.	L.	
Algerian ...	2	11	22	1	13	59	1	17	23	2	17	102	2	17	75	2	7	56	100·0
New Zealand Cape	2	15	107	1	11	9	1	19	7	2	16	33	2	11	81	2	6	92	98·6
Early Kkerson	2	15	106	1	6	108	1	19	7	3	0	86	2	7	0	2	5	106	96·7
Warrigal ..	2	6	61	0	19	75	2	6	56	3	5	53	2	8	31	2	5	33	95·4
Sunrise	2	11	98	1	11	48	1	13	82	2	16	47	2	11	53	2	4	110	94·7
Smyrna ...	2	6	101	1	3	59	2	0	20	2	19	73	2	4	78	2	2	111	90·5
Guyra	1	16	2	1	5	105	2	2	18	2	16	20	2	10	44	2	2	15	88·7
Early Burt	2	13	0	1	5	66	1	18	8	2	9	95	2	2	12	2	1	81	87·9
Palestine ..	2	5	21	0	18	31	1	17	106	2	18	87	1	10	20	1	18	8	80·2

Algerian oats is the most extensively grown variety in the State, because it so well suits the wide range of conditions, is reasonably drought resistant, and is not coarse in the straw.

The yield trial indicates that this popularity is justified from a hay yield point of view, though it is said to produce a slightly bitter fodder, especially if cut green. New Zealand Cape is a very similar variety, and is, in fact, more favored in this particular locality. Early Kherson gives excellent hay yields which can compare equally with Algerian, particularly in dry years. From the grain standpoint Early Kherson is prominent in both dry and wet years. Allowing for an experimental error of 5 per cent., the grain figures still show a marked increase over the standard. Early Burt and Palestine are good varieties whose mean yields are only slightly less than that of Early Kherson. Early Burt is somewhat coarse in the straw, and Palestine too weak. In droughty years the latter is a splendid grain yielder, but lodges badly in wet seasons.

Tables VII. and VIII. indicate which of the varieties are suitable for grain, and for hay, respectively. The following group shows the varieties which are most suitable for both purposes, a factor which is most important with oats:—Early Kherson, Algerian, Early Burt, New Zealand Cape.

The remaining varieties included in the trial have given mean yields which, in comparison with the standard, are good, and are worthy of further consideration in future trials.

Barley.—Eight varieties of barley have been under similar trial, and the results indicate that Prior (as a malting type), Roseworthy Oregon and Shorthead (as feed types) are most suitable for the drier localities.

The errors in the yield caused by wind storms snapping off heads in two of the years is so great as to render them unreliable, and discussion of the results on a comparative basis impossible. It is, perhaps, worthy of mention that the variety Tunis, a six-row type, is almost equal to Roseworthy Oregon and Shorthead, and being earlier, does well in dry years. Plumage Archer, Spratt Archer, Beavens Special (importations from England), and Duckbill were unable to withstand the early hot spells so frequently experienced towards the end of the season.

The Time of Seeding Experiment with Wheat, 1928-32.

The experiment to ascertain the right time to sow wheat was laid down first in 1928, in duplicate plots of approximately half an acre each. Three sowings were made each year, viz., as near as possible to the first days of May, June, and July, respectively, with variety Sultan, which was considered to be typical of the bulk of the wheat sown in the neighborhood.

The yields of the five harvests are shown in the following table, together with the mean yields which are expressed in bushels, and as a percentage of the early May mean yield which is taken as 100 per cent.:—

Time of Sowing.	1928.		1929.		1930.		1931.		1932.		Mean 5 Years.		Percentage.
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	
Early May	10	9	9	15	16	16	20	5	7	17	12	36	100·0
Early June	10	58	12	15	17	29	25	11	16	3	16	23	130·0
Early July	10	43	13	1	14	53	14	13	14	28	13	28	107·0

It is noticeable that, in four out of the five seasons, the early June yields have given the best results. The mean yields of that sowing is 30 per cent. higher than the early May sowing, and 23 per cent. higher than the July sowing. This result confirms general practice in the district, the growers in which do the bulk of their seeding of wheat between mid-May and mid-June.

In two of the seasons, 1930 and 1932, the yields of the May sowings were adversely affected by the prolonged absence of rain after seeding, and in the latter year by soursobs—which could not be killed before seeding, which took place in dry soil. Consquently the growth was quite thin and poor.

The yields of the late seedings suffer by comparison with the mid-season yields in that the hot summer weather usually commences before the wheat is filled, and ripening takes place prematurely, resulting in a decreased yield.

Thus it is concluded that the seeding of varieties similar to Sultan, *i.e.,* early mid-season maturing, should be made towards the end of May or beginning of June.

While it is not possible to forecast the fall of seeding rains, it is general knowledge, and it has been clearly brought out in the above results, that it is unsound practice to start seeding every year on a fixed date, irrespective of whether the season has broken or not. Much may depend on the cleanliness and efficiency of fallowing methods, but, generally speaking, a germination of weeds by the first rains and their subsequent destruction is essential before the wheat is seeded.

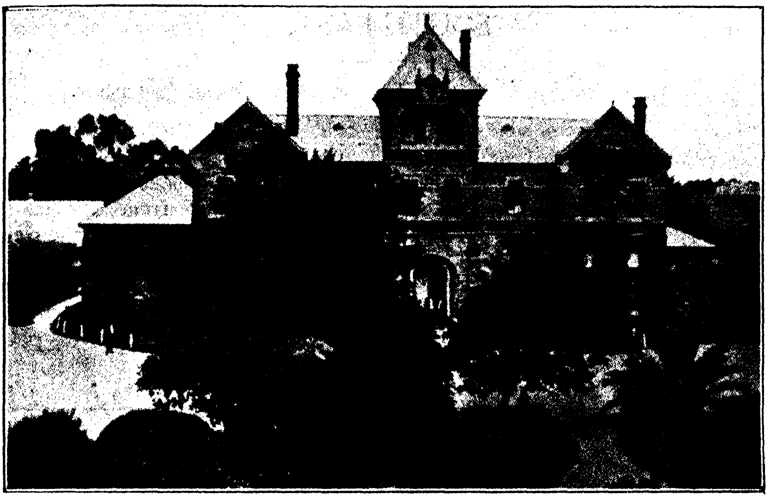
The Rate of Seeding Experiment with Wheat, 1928-32.

The experiment was commenced in 1928 to determine the rate of seeding of wheat which would give the most economical result. An examination of the College records reveals that the rate of seeding has varied from 50lbs. to 100lbs. of wheat per acre, and five rates within this range were decided on, viz., 60lbs., 70lbs., 80lbs., 90lbs., and 100lbs. The different rates were sown in duplicate plots of approximately half an acre each. Late Gluyas variety was used throughout, and all plots were drilled in on the same day.

The yields harvested in each of the five years, together with the means expressed as bushels and as a percentage of the mean yield received from the 60lbs. seeding, are set out below.

Rate of Sowing.	1928.		1929.		1930.		1931.		1932.		Mean 5 Years.		Percentage.
	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	
60lbs. per acre ..	10	1	8	26	9	41	12	50	17	22	11	40	100·0
70lbs. per acre ..	12	7	11	21	9	22	14	2	18	35	13	2	112·0
80lbs. per acre ..	12	8	9	58	10	41	16	11	19	54	13	46	118·0
90lbs. per acre ..	10	24	8	53	10	48	16	52	21	2	13	36	117·0
100lbs. per acre ..	10	18	9	59	10	48	17	2	21	13	13	52	119·0

The results of the first two years indicated that 70lbs. was a sufficient quantity of wheat to sow. In the last three years the seedings of 90lbs. and 100lbs. have given the highest yields but, with the exception of 1932, the increase was barely sufficient to return the extra seed sown. Comparing the mean yields, which show that the differences between the 80lbs., 90lbs., 100lbs. rates of seeding is less than ½bush., or only 2 per cent., the conclusion is arrived at that 80lbs. of wheat seeded will give as good a yield as any higher rate, and a better result than a lighter seeding. The increase in yield received from 80lbs. appears to be a significant one, but the use of higher rates does not appear economical.



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GROWING OF EARLY TOMATOES IN THE SOUTH-EAST.

[By H. H. ORCHARD, R.D.A., District Horticultural Instructor.]

Good fertile soils, plenty of water easily available, and suitable climatic conditions prevailing for a good portion of the year help to make the South-East eminently suited to the growing of vegetables. Distance from city markets prevent very extensive plantings, but the towns within the confines of the South-East, especially Mount Gambier, absorb reasonably large quantities which at present are almost wholly drawn from city sources. The trouble with the few growers who have produced vegetables commercially is the lack of continuity of supply. The retailer requires regular supplies of a commodity during the season, and not what really amounts to a disposal of a surplus.

Glass houses at Moorak, Mount Gambier, the property of Mr. S. G. Marks.

Tomato growing offers great possibilities. To obtain early supplies glass houses are necessary, but with a good local market at hand and good prices prevailing they are worth while. At the present time production is limited to a few houses. The possibilities of the extension of the tomato industry in the South-East are well worth exploiting by the enterprising grower who gets in early.

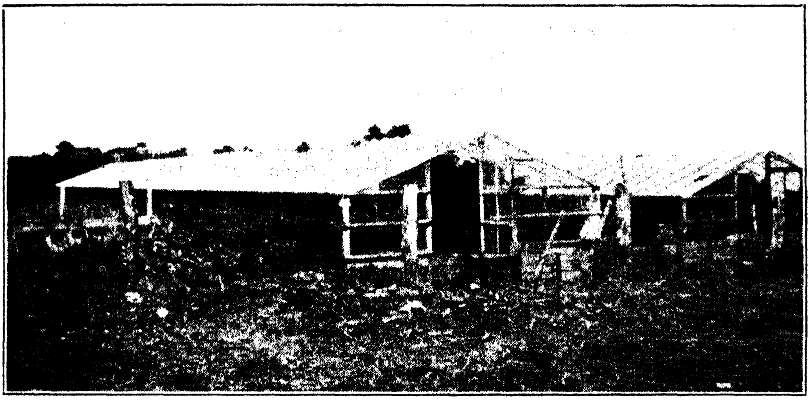
Production is not required before November 1st, in fact it can be said to synchronise with the Melbourne Cup. Tomatoes have been produced in Mount Gambier's limited glass houses by this time, so that districts further north should not experience difficulty in this respect. Supplies can continue then for about three months, as Mount Gambier outdoor grown tomatoes are not ready much before the end of January. Consumption continues right into the winter, so that the enterprising grower producing both glass house and outdoor raised tomatoes has a long season in his favor.

On reliable figures supplied, the retail trade in Mount Gambier is estimated at 100bush. weekly during the early tomato period. If to this are added proportionate figures for other neighboring centres, of which there is quite a number, it can be seen there is an opening for quite appreciable quantities, the bulk of which are now railed 300 miles from the city at £2 14s. 9d. per ton, or approximately 9d. per ½bush. case. The South-Eastern product, quite equal in quality, could be put on the market in fresher and better condition, because of the proximity to the market.

There is, however, one essential thing, the "get-up" must conform to market conditions. The tomatoes must be graded according to size and ripeness, packed in a proper manner, and only sound ones marketed. Size does not altogether influence the sale, but anything under seconds must be kept off the market. The culls are best fed to pigs.

GLASS HOUSES.

The initial outlay for glass houses is high, but can be lightened somewhat by the use of locally grown pine for the framework, a timber which should be quite suitable for the purpose, provided hardwood, such as stringy bark or red gum, is used for the foundations or any part coming in contact with the ground.



Another view of glass houses, showing first one erected four years ago.

The houses illustrated, the property of Mr. S. G. Marks, of Moorak, Mount Gambier, are built of hardwood throughout, the timber being first given a dressing of oil. The house in the foreground was the first erected four years ago, and the others 12 months later. They are all 90ft. long, 15ft. wide, 3ft. 6in. high at the sides, and 6ft. at the ridge, and contain one ton of glass each. When built, the estimated cost of material was £60; the owner and his sons built the houses. The grooved roof battens to take the glass are of galvanized iron. In each house there are seven rows of wire trellis and along these the plants are placed 15in. apart. The first wire is about 6in. from the ground. Stakes are used to support the wires, and binder twine to support the plants to the wires.

During the summer the glass should be sprayed with a solution of whiting and skim milk to prevent scorching of plants and fruit. Means of ventilation should also be provided along the sides, near the bottom of the houses. Have the houses running north and south.

Each year during a portion of the wet weather, the owner of the houses featured removes the roof glass from the houses not required for seedling raising. This practice in conjunction with heavy dressings of farmyard manure and bone dust, and a deep stirring of the soil is a good one as it helps to aerate and sweeten the soil. If it could be extended to the whole area of glass houses it would be better still.

SITE.

One of the main essentials to successful growing is the suitability of the soil. A rich sandy loam with a good clay subsoil not closer than 12in. to the surface should give good results. Good drainage is necessary and provision must be made to carry away any surplus water from the site. Select a piece of ground which will permit of ready irrigation, enable the houses to be placed north and south, and allow sufficient room between the houses to permit shifting at some future date. This room space should be the same width as a house. This enables the roof and ends only to be moved when changing the position of each house.

Seed.

Growers should save their own seed; there can then be no doubt about what they are planting. For the purpose tag the plants giving the most and best early fruit and then save the fruit from these plants for seed purposes. An ounce of seed will produce 2,000 to 2,500 plants.

Varieties.

Earliana is a variety which has given good results in the South-East. New South Wales has a Sunnybrook Earliana which is considered to yield better, and to be of better shape and quality. Early Dwarf Red and Early Large Red are extensively grown in glass houses, and also do well in this district. Acme, Walker's Recruit, and Perfection are others which do well.

Treatment of Seeds and Seedlings.

Care should be exercised regarding the soil used in the seed beds and boxes. A good loam is required containing plenty of vegetable matter and which, for preference, has not previously grown tomatoes or potatoes. The seed should be planted in April in the hot-bed, in rows about 4in. apart, placing seed about ¼in. apart and then covering lightly. Under favorable conditions the young plants should show up in about 10 days after seeding.

The young seedlings require plenty of light and must be kept constantly growing. Strong, stocky plants are essential to the earliest crops and heaviest yields. The seedlings should be transplanted into boxes, and this pricking out is best done when three or four leaves are showing, from four to six weeks after they come up. In the boxes they are placed 4in. apart each way, and these frames or boxes are placed on a good layer of well-rotted manure.

In June or early July the plants should go into the glass house. When lifting be careful to have a square of earth enveloping the roots. With the house soil previously prepared and in good order, the young seedlings receive a little superphosphate at planting and a light watering, and are then best left for several weeks before commencing regular irrigation.

Irrigation.

Irrigation will be necessary, as the plants must be kept steadily moving; they must not receive a check. Strong, sturdy plants are necessary if early crops and heavy yields are to be obtained. Run the water along shallow trenches between the rows and do not overdo the watering. These trenches are afterwards lightly hoed in, to be again opened out in time for the next watering.

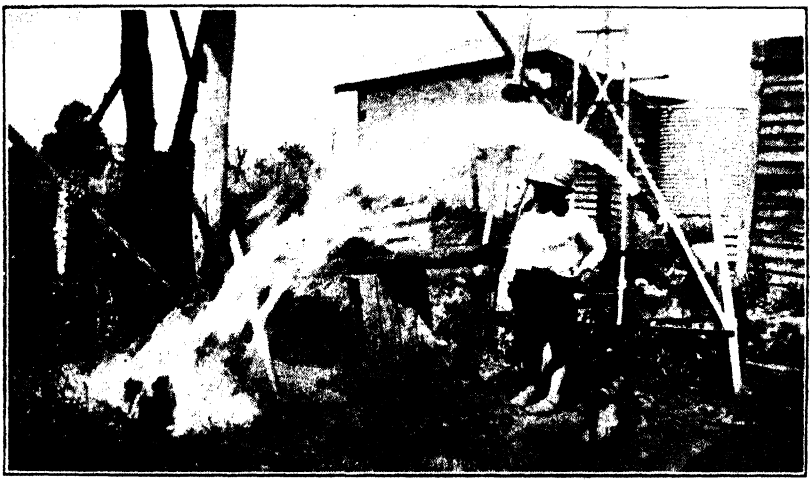
The accompanying illustration of a flow of water at Coonawarra serves to show that good water suitable for irrigation purposes is readily and economically obtainable in the South-East. The depth of water when the photo was taken, the second week in February, was 3ft. 6in. in a well only 11ft. 6in. deep, the water therefore being but 8ft. from the surface. The plant recently erected, comprises a second-hand, 5 h.p. Hornsby petrol engine and a 2in. centrifugal pump and costs less than £40 to erect. Pumping approximately 5,000galls. an hour, the pump is lifting the water 3ft. above the ground level. The owner states that a gallon of petrol gives him 2 to 2½ hours running, approximately 1s. an hour. At the present time he is irrigating a patch of lucerne, and estimates that two floodings, each of two hours duration, gives him a return of 5 tons of green lucerne.

TREATMENT OF GLASS HOUSE PLANTS.

Plants need to be carefully watched, and any of them showing the first indications of disease should be removed and destroyed. The risk of contaminating other plants is too great to allow them to remain on the off chance of recovery. Pruning consists of pinching out the leaf laterals as the plant grows, and when the required height is reached the top is pinched out. The vines are trained to one stem. As fruit forms, light dressings of sulphate of ammonia, super, and potash can be given. Local growers dust lightly their plants from time to time with sulphur. The main thing is to keep the plants healthy and steadily moving.

DISEASES.

Glass house conditions naturally present difficulties not met with in outdoor cultivation. The temperature and humidity of the house alone tends to the development of diseases. The soil grows tomatoes year after year, and a rotation such as can be practised in the open is not possible. The removal of the glass house to a fresh site after a few years is a sound method of control. A bulletin on Tomato Diseases, by Geoffrey Samuel, M.Sc., Plant Pathologist, Waite Agricultural Research Institute, is available.



Flow of water on Mr. E. Gaffney's property, Coonawarra. The boy is standing immediately under the stream and serves to show the head of water.

HARVESTING.

The fruit ripens from the bottom of the vine upwards, and should be picked when it shows color at the blossom end. The tomato is easily injured in handling and transit, and care must be shown in selecting only sound fruit for market.

In the preparation for market, tomatoes must be graded according to quality, size, and degree of ripeness, the cases well packed and branded in accordance with the contents. Only by these methods can a grower hope to hold the trade. The tomatoes will sell if there is nothing wrong with the quality, and it is recognised that they are not soft, as is sometimes the case with those railed into the district.

AFTER HARVEST TREATMENT.

After the crop is harvested the plants should be removed at once and destroyed. In some instances a dressing of lime could follow soon afterwards and be dug in. Each year the house should be cleaned thoroughly, the glass removed, and the whole of the framework well sprayed with Gishurst Compound, or failing that, tobacco wash. The glass should be treated also.

THE ONION (*Allium cepa*).

[By CHAS. H. BEAUMONT, District Horticultural Instructor.]

The use of the onion and its cultivation are matters of ancient history; there is no doubt that it was known and appreciated 2000 B.C. in Egypt and in other parts of Africa. It cannot be said exactly when it was introduced into Europe, but it was known and cultivated by the ancient Britons. It has always kept a leading place in household use in France and Spain. Spain has the reputation of producing the best onions. It is recorded that the Israelites introduced the onion into Asia on their escape from Egyptian bondage, and its use was well established on that continent. The onion is now grown and used throughout the whole world.

The onion and its allies may be considered as constituting a class of vegetables that supply savor rather than nutritious principles. They are grown merely because they appeal to the palate and for the flavor they impart to other foods, rather than for their genuine food value; as Sydney Smith says:—

> "Let onions, atoms, lurk within the bowl,
> and, scarce suspected, animate the whole."

The onion contains 87½ per cent. of water and 12½ per cent. of solid matter.

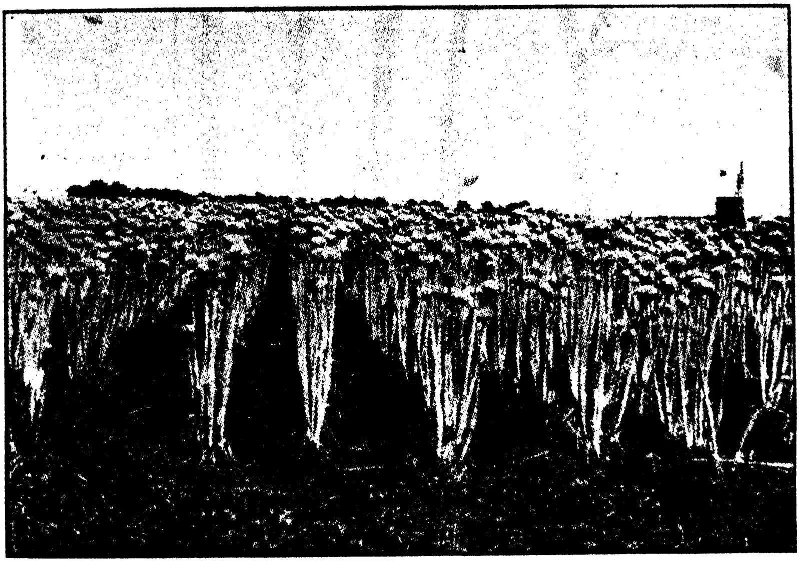
It is a biennial herbaceous plant, with long tubulated leaves, a swelling pithy stalk, thicker in the middle than at either end. The roots form concentric coats varying in size according to soil and climate, and in color from white to brown. There is a number of varieties of onions; onion growing districts have evolved a type specially suitable to that district, but generally speaking, the brown onion is the more useful for keeping or storing; the white has a milder flavor and requires to be used within a reasonable time after digging.

To grow onions successfully, it is absolutely necessary to have good seed, to see that the land is thoroughly prepared, and to have suitable soil in a suitable locality. It is admitted that onions will grow under a wide range of soil and climatic conditions, but if growing is undertaken on a commercial basis, a suitable locality is a necessity. In South Australia, the higher altitudes are best; the soil should be a deep sandy loam, or the peat soils of our southern swamps. The site should be well drained, and if natural drainage is not good, artificial drainage will be necessary. New land should be broken up at least 12in. deep in early winter, so that vegetation turned in will rot. The land must be broken down to a fine tilth early in spring and all weed growth kept under control. If it can be arranged, it is advisable to grow potatoes as a first crop, the cultivation of which will ensure better preparation for the onion crop; a crop of onions may be taken off the same land two years in succession; in fact they may do well for several years, but it is better practice to grow a leguminous crop occasionally to be ploughed in for humus. Continuous cropping is likely to cause the land to become infested with fungus and insect pests.

SEEDING AND PLANTING.

To obtain good seed, it is advisable to select the best bulbs. They must be true to shape, size, and color, have a fine neck, full shoulder and good skin. The bulbs should be planted in rows 30in. to 36in. apart with 15in. to 18in. between the bulbs if horse cultivation is intended. The planting will be done as soon as the winter rains makes the soil in good condition, May, June, or July. Weeds must be kept down. About 250lbs. of bulbs will be required to plant an acre; the bulb thus planted forms adventitious roots from the base of the stem, and the terminal growing point inside grows up into the air and produces leaves, and an infloresecense of white flowers at the end of a long hollow stem. The materials stored in the bulb scales are used in this development of flowering stems, and after the production of ripe seeds, the whole plant dies away. The food supply is chiefly in the form of dextrose. Harvesting is done by hand, when the seed is ripe, by gathering the heads into baskets or tins, and rubbing or threshing out.

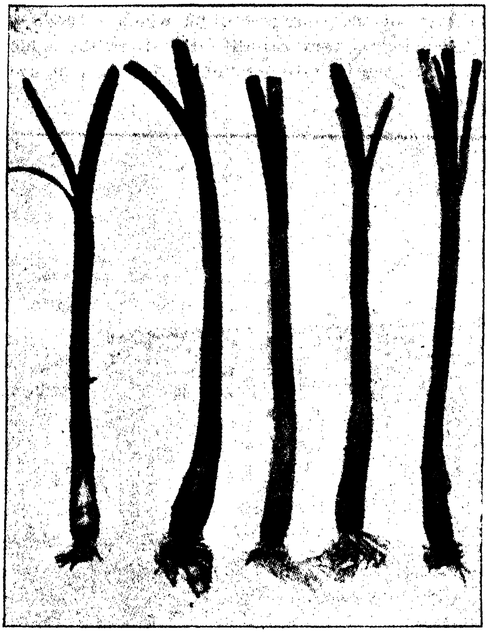
The seed is black, somewhat oval in outline, with one side convex and the other almost flat. Each contains within it, endosperm and an embryo which lies curled up inside. When germination commences, the curved part grows and forces the end of the embryo out of the seed. From the exposed end, a straight slender primary root develops. The part of the young seedling which extends from the root into the interior of the seed, grows very rapidly at first, at the same time assuming a sharply bent outline. It comes above ground in the form of a close loop: but on further growth, the end within the seed is pulled out of the soil and grows up into the air. The tip within the seed changes and absorbs the endosperm, and usually remains there until all the nutrient matter has been transferred from it to the various centres of growth in the young plant. After the food reserve is exhausted, the tip withers and becomes free from the seed coat. The curved part of the embryo which comes above the ground is a leaf; it is the cotyledon of the embryo, and is in reality a thin hollow leaf similar to those of the full grown plant; within it is the plumule, which consists of a series of hollow conical leaves arranged inside one another. After one leaf emerges, others soon follow, the younger ones coming out in regular order through slits in the sides of those immediately older than themselves.



A Seed Plot.

Some growers sow the seed direct, and it is planted as early in spring as soil conditions will allow. If hand cultivated, the rows may be 15in. apart, but double that distance will be necessary for horse cultivation. If required for ordinary market purposes, the seed will be sown as thinly as possible with a drill, but if small picklers are wanted, use more seed. About 5lbs. of seed will sow an acre for market onions, and 25lbs. if for small size. The seed bed requires firming after sowing. Thinning out will be done at the first hand weeding in the rows until the plants are left the distance apart required for the crop desired.

In South Australia it is the usual practice to sow the seed in a specially prepared bed, hot bed, cold frame, or at times in the glasshouse, and the seedlings are transplanted. Transplanting is done as soon as the seedlings are sturdy enough, and they are trimmed by clipping the roots and tops.

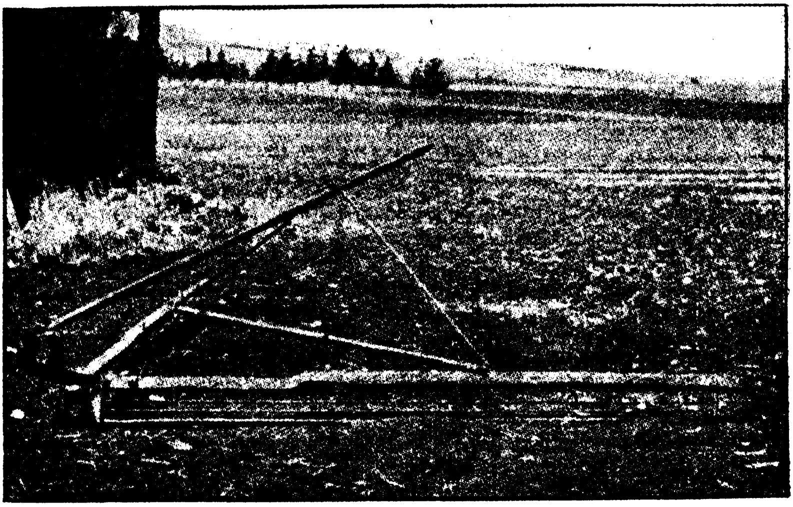


Seedling onion plants trimmed ready for transplanting (one-half natural size).

The young seedlings should not be exposed to the air any longer than is absolutely necessary. Keep them in bundles in a container with water and take out only enough at a time to keep the planter busy. The planter's job is to make a small shallow hole to take the seedling and then firm the soil about its roots. The distance between rows and plants will be governed by the intended method of cultivation, and the type of crop required. The principal work after transplanting is to keep the surface soil loose and free from weeds, and apply water if necessary.

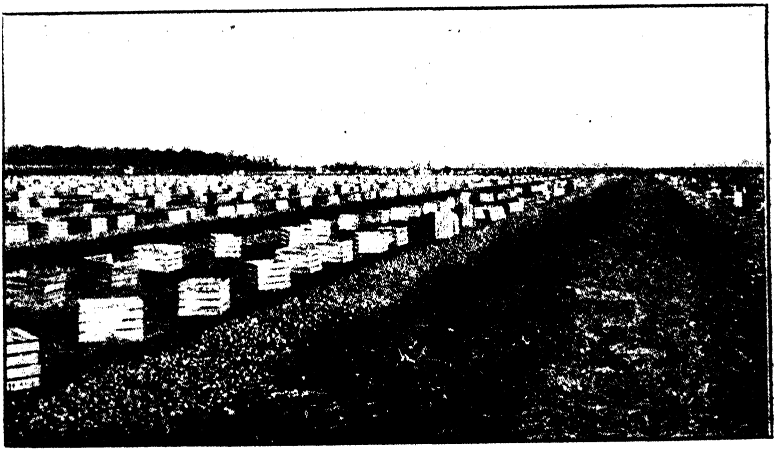
HARVESTING.

When the onions are ready for harvesting, the tops will die down and shrivel, and the outer skin of the bulb will dry. Gathering is mostly done by hand pulling, but an implement, the skimmer, is used on the larger areas, and may be made to take one or more rows at a time. The skimmer merely loosens the bulb under the surface, but if carelessly handled it may ride above the surface and cut the bulbs. The onions are gathered into small heaps to cure, but must not be allowed to get wet, or to remain long enough to harden the outer skin, because it will peel off, and the market value will be lessened. The weather at the time of harvesting must determine the time required. An implement known as a "triangle" will gather together several rows at a time.



Triangle.

The next operation is that of topping and stripping, tops and roots and loose skin are removed, and the onion is left clean and ready for use. In the United States of America machines are used for this work. After cleaning, the onions should be sized according to trade requirements, and if intended for immediate sale, may be bagged at once, but if intended for storing, crates should be used. The illustration below will serve to show a good type of crate to use.



Onion drying in windrows, showing crates used for curing and storing.

When crates or bags are placed in store, they must be stacked with space between every row, and the first tier kept off the ground a few inches; even in the field the bags should be kept up from the ground. For successful storage, there must be good ventilation in a shady, dry, and cool storehouse; the vents should be from the floor level to above the stack, and the roof have louvred vents; no stagnant corners are allowable. The practice of storing in a heap on the barn floor cannot be recommended , and the only onions to go into the store must be those which are known to keep well; any that are damp, immature, broken, soft, or those with thick necks must be put aside for immediate use. Ten tons would be a good crop to expect, but at times up to 20 tons are obtained.

COLD STORAGE.

Preservation of onions by cold storage may have considerable advantages. To be successful in this method, the same precautions are to be observed as for ordinary storage; only well known keepers, in good condition, should be used. Crates are best, but if bags must be used, then it will be necessary to form shelves of planking to keep the weight from the lower tiers.

A separate compartment is recommended, and it must be stowed so that there is good circulation. Other produce is liable to be contaminated by the gas from onions.

The compartment will be cooled off before loading and the temperature thereafter kept at 31 deg. F., and the relative humidity at 78 deg. The temperature may vary to 32-3 deg. F. during ventilation, which is arranged for by admitting cold air at one end of the compartment and discharging the gas laden air into the outer atmosphere at the other end.

Onions can probably be held the year round, the governing factor being the cost of holding and the market prices. At six or seven months they can be sold from the store in perfect condition.

The onion is a good feeder and it will be found necessary to apply fertilisers. Farmyard manure is the best, but as that is not procurable in sufficient quantity, the better way is to plough in a green crop in winter. If artificial fertilisers have to be used, apply from 2½cwts. to 4cwts. per acre of super, and later a dressing of sulphate of ammonia at the rate of from 1cwt. to 2cwts. per acre between the rows, this will be cultivated in; care must be taken not to put any of these fertilisers on the foliage of the plant.

South Australia does not grow enough onions for home use, and the latest figures available show that we imported 8,000 bags for the year from Victoria, which is the only exporting State in Australia. For the past five years Australia has imported 9,759 tons of onions, valued at £113,560, principally from Japan, and has exported 15,226 tons, valued at £163,393, mainly to New Zealand and the Pacific Isles.

There are a few variations from the ordinary onion which can be briefly mentioned—"Tree Onion," "Potato Onion," "Shallots" (Eschallots), the Welsh onion, "Leek," Garlic, and Chives. The Tree Onion develops small onions on the seed tops. These small onions are again used for seed. The Potato Onion grows clumps of onions at the soil surface; at times they grow to fair size, but are mostly small; the bulbs are used for seed, though true seed develops if allowed. The Shallot or Eschallot grows in clumps and fresh lots are produced by separating the plants; they are greatly esteemed for their mild flavoring, both tops and bulbs being used. The Leek has a thickened stem almost the full length of the plant and is excellent for its flavoring qualities. Garlic is an extra pungent variety of onion, in growth not unlike the potato onion; its main use is for flavoring sauces. Chives are small oval bulbs and grow like shallots, but the tops are finer; they are not often heard of in Australia. The Shallot at times forms a seed head and then resembles the tree onion. The cultivation of these variations is the same as for the main onion.

PESTS AND DISEASES.

South Australia is not troubled to any great extent by either insect or fungus pests. Most of the trouble is caused by faulty storage, or rather by not careful selection for storage.

Onion Mildew (*Peronospora schleideni*) is a troublesome disease, and usually shows on the tops in pale spots or blotches, which increase until the whole top is affected and dies off. As soon as discovered, remove the affected plants if few and burn them. Dust the crop with sulphur and lime; 2 parts of flowers of sulphur to 1 of air-slaked lime, thoroughly mixed. All refuse should be burned.

The Cut Worm is a night feeder and may become a nuisance; it can be poisoned by mixing dry 10lbs. of bran with 4ozs. of arsenate of lead, and then damping with molasses or treacle and water. Several applications may be necessary, as only the damp mixture attracts. When spreading keep as close to the plants as possible without touching them.

Eel Worm may cause great trouble and loss, and onions should not be planted in soil known to be infested.

Thrips and Rutherglen Fly have given some trouble at times, but have never been serious. Tobacco mixtures are a repellant, the dust being easiest to apply.

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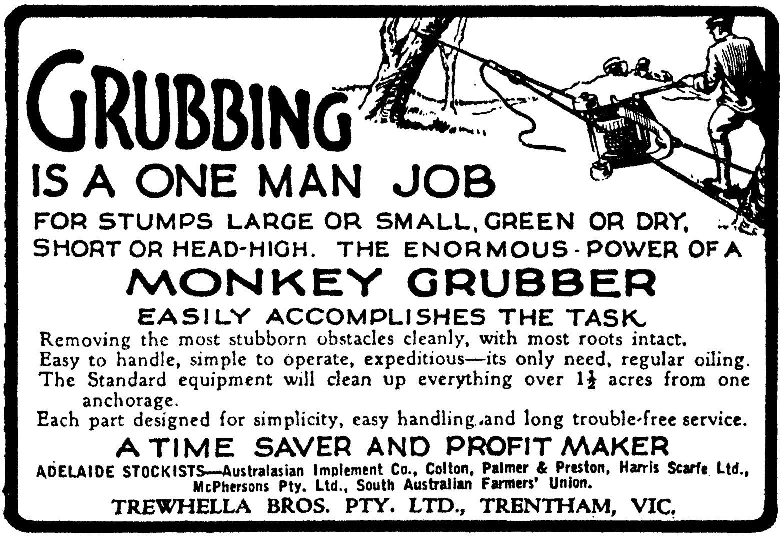
Burbank.
N.Z. Journal of Agriculture.



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TURNIPS IN THE SOUTH-EAST.

[By E. S. Alcock (District Agricultural Instructor).]

It is well known that it is not the good seasons and periods which make for progress in agriculture, but rather the leaner periods. When prices are down and yields low the various crops grown and methods are carefully reviewed and different crops and methods given a trial. Those which are successful remain.

To-day we find landholders turning their attention to various crops and methods which a few years ago they had more or less neglected. Now that the keeping of livestock is receiving more attention in this part of the State which enjoys such a good rainfall, more attention could be given to the growing of such crops as turnips, for the supply of forage.

In all countries where livestock are kept to any extent some forage crops are grown in order to maintain the maximum number of stock all the year. Where conditions are similar to our own these crops are sown during the spring and then fed to stock during either the summer, autumn, or winter. It is well to remember, however, that the growing of such crops annually can only be accomplished by setting out the work carefully, making plans to ensure that the crops are sown on well-prepared land at the right time of the year. Good crops are often raised on hurriedly-prepared land, and thus many farmers are inclined to repeat such methods and are surprised that the results hoped for are not secured.

Turnips as a Forage Crop.

Turnips are considered a valuable forage crop in England and New Zealand, where their value for livestock has been realised and appreciated. Mr. Primrose McConnell, when writing about the importance of this crop, asks the following question:—"Is the turnip crop losing its high place amongst the livestock foods grown on the farm?" He then points out that no crop is perfect and in the past this valuable crop has been much abused, and to-day he considers that the maximum results from turnips can only be obtained by feeding a small percentage of concentrates or dry matter with the turnip crop.

In New Zealand, despite the improvement in pastures, it is still found advantageous to grow turnips, as they are a most valuable forage crop for sheep and cattle, and in this respect few other crops have been found to supplant them. Locally we need not look beyond the results which have been obtained at the Experimental Farm at Kybybolite. Each year Mr. L. J. Cook (Manager) points out that the value of this root crop depends mainly on the time of the year when the feed is available. Stockowners will probably realise this more fully when it is mentioned that the turnip crop is fed during the months of June, July, and August, when the feed on the pastures is at its worst and a period of the year which causes most concern, as after August there is usually an abundance of feed. The value of turnips as forage cannot be better expressed than by quoting the results at Kybybolite, where a field was capable of carrying 30-50 sheep per acre, for a month or more during the lean winter months.

The results obtained from turnips at the Kybybolite Experimental Farm are given in the following tables:—

Grazing of Turnip Crops, 1930-31.

Field.	Area in Acres.	Total Feed Days.	Sheep Carried per Acre per Year.
No. 4c	4·05	10·970	7·42
No. 6d	9·14	13·010	3·90
No. 9c	1·94	2·673	3·77
Total	15·13	26·653	4·83

The next table gives the results for the 10 years ending 1930-31, and also the annual and summer rainfall:—

FEEDING RESULTS FROM TURNIP CROPS AT KYBYBOLITE FARM, 1921-31.

Season.	Total Rainfall, May 1st to April 30th.	Summer Rainfall, Dec. 1st to April 30th.	Area in Acres.	Total Feed Days.	Sheep per Acre per Annum.
	In.	In.			
1921-22	21·36	3·45	15·59	12·848	2·26
1922-23	19·33	3·52	16·80	12·417	2·02
1923-24	31·02	7·80	16·40	23·520	3·88
1924-25	17·00	2·83	16·36	8·564	1·43
1925-26	16·04	2·89	15·19	9·218	1·66
1926-27	18·87	3 70	15 56	14 772	2·60
1927-28	20·89	6·69	16·70	17·960	2·95
1928-29	22·47	5·51	18·03	16·747	2·54
1929-30	19·09	4·46	15·19	12·282	2·22
1930-31	23·74	7·59	15·13	26·653	4·83
Total	—	—	160·95	154·981	—
Means	20·98	4·84	—	—	2·64

This crop is much too important to be given only a passing thought by those landholders who are anxious to increase their returns by carrying more stock. From time to time we hear that turnips have been tried and failed, but before this is accepted as a final judgment the details should be more carefully examined to ascertain the reason for the failure. There are many aspects which might contribute towards a failure, such as the wrong variety, time of seeding, season, etc.

In the South-East, where conditions are favorable for the production of good pastures and with the improvements in this direction to-day there is a tendency to discard the use of the plough and neglect the growing of forage crops. Also, with the introduction of modern machinery it is gradually becoming possible to conserve an abundance of fodder as hay and ensilage very much more easily and conveniently than formerly where top-dressing of pastures has become an annual practice. While these methods are to be recommended and encouraged, there are certain considerations such as seasonal variations, diseases, pests, and lean periods of the year when pastures are not at their best and over which we have very little control; therefore the need for growing forage crops.

FORAGE CROPS NECESSARY WITH TOP-DRESSED AREAS.

It should be borne in mind that the improvement of pastures by top-dressing is only one stage towards the effort being made to carry the maximum number of stock per holding and that the pastures need supplementing by forage crops. In this direction the turnip crop should be just as useful here as it is in New Zealand and England. For if we examine the results from these countries we shall find that forage crops have always played a very important part in the livestock industry. Whether we are interested in the production of milk or meat we know that all livestock are better for an abundance of succulent fodder all the year, and this is the part which forage crops play, as they supply the necessary succulence during the lean periods and should also ensure a regular and constant supply. On a well and efficiently managed holding it is the aim of the manager not only to keep his livestock alive, but to keep them at their top all the year, and to do this provision must be made for adequate supplies during the lean periods. If provision is not made for holding the maximum number of stock during the lean period it becomes necessary to reduce the number of stock, and this cannot always be done with advantage to the livestock owners. The livestock owner often finds that under such conditions he is forced to sell some of the stock which he can least afford to part with. The best feed that can be supplied to stock is undoubtedly that grown on well fertilised pasture, but so far we are unable to maintain these pastures at their top all the year round.

Another aspect worth considering, especially at the present time, is whether the full value or return for the money spent in purchasing the land, seeds, manure, and livestock, &c., is being received, unless the maximum number of stock is being carried throughout the year.

This is a very strong point in the favor of the growing of forage crops and needs more careful consideration by owners of livestock. A common excuse often raised is that the cost is too great, but the majority of landholders and stockowners have all the necessary plant for doing this work, and again on most well improved farms the same amount of super would be used for top-dressing.

Turnips Improve the Land.

The growing of turnips and such crops should leave the paddocks in a much healthier and better condition, because the turnip crop is used as a cleaning crop in rotations. Thus the land is cleaner and freer from weeds, and it should also be of high fertility on account of the stock droppings and also small portions of roots and leaves which become worked into the soil by the stock when grazing. The cultivation which is necessary to grow good turnip crops thoroughly aerates the soil which under such conditions will produce fresh sweet pastures which are relished by stock. If we notice stock which have access to more than one pasture we find that, other things being equal, they prefer the fresher or more recently cultivated pasture.

Rotational grazing and harrowing will do much to reduce fouling and staleness; nevertheless there is nothing like a change to a freshly cultivated or recently sown area. The continuous grazing of the paddocks has been rather overdone in this district. Most stockowners will agree with this, but have not yet made up their minds which crop is most suitable for their purpose.

Area to Sow.

The area that can be conveniently and efficiently handled is very important, as we generally find that most landholders are rather inclined to over-estimate the area they can manage successfully, especially when dealing with root and forage crops generally. Therefore, it is wiser to attempt only a small or comparatively small area until some experience in the handling and feeding of this valuable crop has been obtained. The first attempts should be confined to a small paddock which lends itself to this work, a paddock which can be conveniently sub-divided when being grazed, and handy and convenient to work. If this method is adopted one will gradually learn how to handle this valuable crop, and when its true value is fully realised stockowners will not be without it. It is not advisable to sow wet low-lying areas which are liable to be flooded owing to the difficulty of not being able to make use of them before the winter rains fall, unless of course the crop is to be lifted and stacked.

Amount Consumed by Stock.

Much difficulty is experienced by men who have handled this crop in estimating the weight of a crop of turnips. They mostly over-estimate rather than otherwise. It is a simple matter, of course, to ascertain the yield by lifting definite measured areas of a regular size, taking care to see that they are a fair average of the crop, weighing them and calculating the results. A full grown sheep will consume about 30lbs. of turnips per day when fed on this crop alone, and therefore, a 20-ton crop per acre would feed 100 sheep for 14¾ days, or equal to four sheep per acre per annum. A fullgrown bullock will consume 1 ton of roots per week, so that a 20-ton crop per acre would feed 20 bullocks for seven days. When turnips are analysed, they are found to be nearly all water, but despite this fact, it is rather interesting to note that animals will consume large quantities of water when fed solely on turnips. It has been shown that bullocks fed solely on these roots drank 9lbs. of water for every 10lbs. of turnips eaten.

USE DRY FEED WITH TURNIPS.

The experience both in England and New Zealand has proved that it is more profitable to reduce the amount of roots and increase the amount of dry feed, especially when fattening stock on this crop. No definite rule can be laid down, as all stockmen know each individual case has to be treated on its merits, but most men who have had experience know that stock do better when dry feed is given with such root crops.

TIME OF SOWING.

The time of sowing is very important, as much of the success depends on this, and therefore careful consideration should be given to it in order to eliminate the risks of failure. When arriving at the correct or best time of the year for sowing, it must be remembered that the small seed of turnip does not germinate readily when the soil temperatures are low and the ground wet and cold. It is, therefore, advisable to delay seeding until the warmer weather. Do not sow when the land is too wet, owing to the danger of causing the land to cake on the surface, which is likely to affect the germination and also prevent the growing plant from getting through. Therefore, seeding in this district will be best carried out during the spring or early summer months, *i.e.*, beween October to December, depending on local conditions and seasonal variations.

SEED BEDS.

Seeing that the seed of the turnip is very small, it needs a well-prepared, firm seed bed and shallow sowing. Ploughing should be carried out during the winter (July) to a depth of 5-6in., then left rough during the winter so that the winter rains may penetrate, and thus allow the soil to become thoroughly aerated and mellow. The soil should remain rough for some weeks and then be worked down with the cultivator and harrows in order to keep it clean and free of weeds. This is important, as weeds should not be allowed to grow to any size, because if they become well rooted the land will have to be worked deeply to check them. This means that the seed bed is destroyed by loosening the underlayers which should be well packed down. Each cultivation should be at a shallower depth than the previous one, with the idea of creating the ideal seed bed. Then just prior to drilling the use of a heavy roller is recommended to make sure the seed is sown at a shallow depth on a firm bed. At times it may be necessary, or of advantage, to give another rolling after drilling.

SOWING.

The seed may be mixed with the fertilisers, but only just immediately before sowing. Mix only sufficient for the day's requirements. To facilitate the clearing of this crop it is sown in rows 28in. apart, and this is accomplished by blocking up those feeders which are not required. This can be done in several ways, and the following suggestions may be useful:—

Remove the stars or feeders from the fertiliser box and replace with a short, large-headed bolt. This will prevent the fertilisers from running out.

Another method is to cut pieces of board so that they fit snugly into the fertiliser box in such a manner to form a separate compartment for those feeders which are operating. There is no need to take the tubes off.

AMOUNT OF SEED PER ACRE.

The amount recommended varies within certain limits. It must be remembered that the preparation of the land has entailed some work. Further, relying on this crop to produce some feed during a lean time of the year, it is necessary to use sufficient seed to make sure that there will be enough plants to fill the rows. In good seasons this will be more than is required. Some form of thinning will be necessary. At the Kybybolite Experimental Farm 2lbs. of seed per acre were used with satisfactory results, and 4lbs. were found to be excessive. With 2lbs. of seed per acre, in favorable years, it has been found necessary to run the cultivator across the rows in order to reduce the number of plants. If they are too thick the roots do not develop properly, the stronger plants destroying the smaller and weaker ones, and where there is a number of plants of equal vitality there is usually a large number of small, poorly grown roots if they are too thick.

VARIETIES.

So far not much work has been carried out to test the various varieties in this district, but at Kybybolite Mammoth Purple Top has been grown successfully for some years.

MANURING.

This crop belongs to the family of *Brassica*, and it prefers fertile soils. The application of phosphatic manures is recommended at the rate of 56lbs. 45 per cent. super per acre. The crop also likes sweet soils, and applications of lime assists it. Where soils are deficient in lime, dressings of 5cwts. per acre are recommended, and this will assist the development of good roots.

CULTIVATION.

Attention has already been drawn to the need for thorough cultivation in preparing the land for turnips previous to sowing. The subsequent cultivation is also most important. The first cultivation should be given as soon as the young plants show up in the rows, and this should on no account be neglected, for it is very important to the young seedlings that they have the soil loose around them and the weeds checked. So important is this first cultivation that the success of the crops is largely dependent on it. During the season they require cultivating when weeds are showing, or the surface sets hard. A definite number of workings cannot be stated, as these will vary from year to year, according to season, but good crops of turnips cannot be grown unless they are kept clean and free of weeds. The implement usually used is of the Planet Junior type, although several home-made machines, which answer the purpose, are to be found in the district. These are made by using two or three pieces of hard wood (3in. x 3in.); they are hinged in the front and then held in place at the rear by a piece of iron or wood, in which there is a series of holes or slots in order to allow the tines to be adjusted to suit the width of the rows. The tines consists of spike-like harrow teeth and which are driven into the hardwood at suitable distances, and handles are attached. This will be found quite a useful type of implement on all farms for this type of crop.

FEEDING.

The great advantage of turnips is that they can be fed just when the feed is most required, *i.e.*, after the plants have made their maximum growth. In some seasons it will suit the management to feed them during March, whilst at other times and years it will not be required until August. The crop will not deteriorate by leaving it in the ground, provided the previous precautions have been taken. However, stock should not be turned in to graze the whole area at once because if this is done a considerable amount will be wasted, especially during wet weather. Stock will first eat the crown out of the roots, and this will leave a hollow resembling a saucer which will retain the moisture, and if allowed to remain will cause delay. Therefore, to avoid this fence or divide the field into small areas, and allow the stock access to a small portion, and when this is cleaned up move them on to another portion, and thus avoid waste.

MAIN POINTS TO BE NOTED.

1. Turnips are a most valuable forage crop and worthy of consideration, especially in conjunction with well improved pastures.
2. The crop is usually fed during the winter months, when 30-50 sheep per acre may be maintained for three to four weeks.
3. Sheep will eat 30lbs. of turnips per day, and a bullock 1 ton of roots in a week when fed on them alone.
4. The expense of growing is not great.
5. The growing of turnip crops improves the land for succeeding crops by leaving the land cleaner and free of weeds, and also in better heart.
6. Do not attempt large areas for a start, it is better to commence with a small area sown on well prepared land.
7. Prepare land thoroughly by ploughing 5-6in. deep in July; then work down to fine tilth.
8. Then consolidate the underlayers and seed bed by means of a roller, and sow only on a firm seed bed.
9. Sow seed shallow in rows 28in. apart when conditions are favorable.
10. Use an ample supply of fertiliser in order to give young plants a good start.
11. Use 2lbs. good seed per acre.
12. Cultivate between rows as soon as the young plants can be seen.
13. Keep clean and free from weeds.
14. Turnips can be fed as early as March, or can remain until mid-winter.
15. The land can be used for growing a spring cereal if desired.

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THE CAUSE AND REMEDY OF NAVEL-ILL IN FOALS.

[*Reply supplied by Mr. A. H. Robin, B.V.Sc. (Veterinary Officer, Stock and Brands Department), to a question asked at the Mid-North Conference, Gladstone, March 15th.*]

Navel-ill, or joint-evil as it is also called, is caused by infection occurring through the navel at or subsequent to birth, and occasionally prior to birth. The disease may be caused by a variety of organisms.

So far as actual treatment of cases is concerned, this is rarely satisfactory. The majority of affected animals die, and those that do not seldom develop into thrifty healthy animals.

If treatment is attempted, the affected foal should be isolated as much as possible. Its strength should be kept up as well as possible by inducing it to suck, or by forcibly feeding it with its mother's milk. Stimulants (such as teaspoonful doses of spirits of nitrous ether, &c.) and internal antiseptics (such as sodi hyposulph., 1 teaspoonful; salol, 15 to 30 grains; or potassium iodide, 5 to 10 grains) must be given repeatedly.

The navel should be carefully examined, and if any abscess is found it must be well opened, drained, and thoroughly disinfected with a single dressing of carbolic acid and glycerine in equal parts, followed subsequently with less severe dressings of iodine solution or 1/1,000 solution of biniodide of mercury.

Treatment of any infected swollen joints or other swellings will vary according to the conditions. If these are non-suppurating a 1 to 16 biniodide of mercury blister, or a belladonna and soap liniment may be rubbed into them. If abscess formation occurs, these should be opened, drained, and irrigated with an antiseptic solution and kept covered between dressings with an antiseptic pad applied under a bandage. Great care must always be taken that the contents of abscesses are never allowed to be spilled over the floor or ground and thus serve to spread infection about the place.

The chief line of attack against this disease should be that of its prevention, and success in this direction is largely a matter of proper hygiene, so that the risks of infection of the navel taking place may be minimised.

Particular attention should be given to see that by effective disinfection, foaling quarters are made thoroughly sweet and clean and all bedding used should be unsoiled and fresh. As it is difficult to disinfect loose boxes thoroughly, pregnant mares should for preference, wherever possible, be kept at pasture and foaling take place out of doors.

As soon as the foal is dropped, the navel must be carefully and thoroughly disinfected and dressed, and in carrying this out, the operator must be careful that his hands and arms, &c., are scrupulously clean.

Preparations should be made a day or two before the foal is due. First of all, a suitable length of antiseptic tape for tying the cord should be prepared by soaking a piece of ordinary tape ½-¾in. wide, in weak tincture of iodine, leaving the tape in the solution until it is actually required for tying the cord.

The following solutions should also be prepared in separate bottles:—

(*a*) First Solution.—Iodine, ½ dram; potass. iodide, 1 dram; boiled rain water, 1¾ pints.

(*b*) Second Solution.—Iodine, ½ dram; methylated spirits, 1¾ pints.

(*c*) Third Solution.—1 per cent. iodine in collodion.

When the foal is dropped the navel and cord should be thoroughly disinfected by applying the first solution with a soft brush. Then the cord if it is not ruptured, is tied closely to the body with the antiseptic tape and cut with a clean knife or pair of scissors just below the ligature. The second solution is then thoroughly applied to the stump of the cord and the adjacent skin. When this has thoroughly dried the navel, finally apply the iodine in collodion as a protective dressing.

This treatment sounds perhaps a little complex, but if these various solutions are prepared beforehand in their separate jars, labelled 1, 2, and 3, and the handle of the brush in each case is passed through a hole in the cork, the dressing of the cord is very easily carried out with the foal held on its back or side.

As infection of the navel may, and probably quite often does, take place during the delivery of the foal at birth, through infection being present in the breeding passage of the mare, the mare's passage should be douched out with a weak antiseptic solution a day or two prior to foaling, using preferably a preparation known as "Monsol," and her tail and hindquarters disinfected by sponging with the same preparation prior to the commencement of foaling.

Of recent years, vaccine treatment (carried out in conjunction with the above outlined hygienic measures) has proved to be helpful in the prevention of this disease, and consists of injecting 10 C.C.'s of antistreptococcal serum into the mare 10 days prior to the expected date of foaling, followed by a second dose of 20 C.C.'s given three days before foaling. 10 C.C.'s of the same serum are also injected into the foal when it is 48 hours old.

In some quarters it is claimed that if the mare is given a course of iodine internally for two or three months prior to foaling, it will greatly lessen the likelihood of navel-ill affecting the foal. Whether this is so or not still remains to be proved. At the present time no definite opinion can be expressed on the point.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR APRIL.

[By CHAS. H. BEAUMONT, District Horticultural Instructor, &c.]

This month will see the end of the fruit harvesting, with perhaps a few exceptions, and all bags and boxes should be repaired, cleaned, and stored away for next year. Every endeavor should be made to control pests; early action is advised to prevent them over-wintering if possible; to do this it is necessary to clean up all windfalls and waste fruit and effectually destroy it; clean up the trees so that no natural harbor is left; use bandages about apple and pear trees to collect any stray caterpillars, and destroy them later.

Spray all trees which have had fungous diseases with Bordeaux mixture, and turn the spray on to fallen leaves.

Drying racks and trays should be cleaned and left open to the weather and birds; especially be sure that no refuse is left in sweat boxes or about the store.

Tomato houses should be opened to the weather, and the soil roughly dug after removing all old plants. Sow peas or beans as soon as the weather permits; this may also be done in the open orchard if a cover crop is wanted; use 2cwts. of 45 super, when seeding, per acre.

Have holes open for new trees or extensions, and order trees early.

See that surface drains are clear and ready for flood waters, and keep strawberry beds free from stagnant water.

Citrus trees should be sprayed with Bordeaux mixture to prevent brown rot; the lower limbs need special attention, and some spray should be on the mulch about the trees. Protect the young trees from frost, especially the exposed stems.

Experiments with sulphate of ammonia will need to be followed up early.

Ploughs and all implements for cultivating should be in good order and ready for use; plough as early as possible.

Pruning may be commenced. If rains hold off irrigate all trees and assist bud development.

SEEDLING WALNUTS.

[At the Conference of Mid-North Branches of the Agricultural Bureau, held at Gladstone on March 15th, Mr. G. Quinn (Chief Horticultural Instructor) supplied the following information as to the best method of working over seedling walnuts.]

Seedling walnuts can be budded or grafted to more desirable kinds.

If budded, March is a good time to do the work. This can only be done on shoots, say, up to the thickness of a man's thumb and when the sap is flowing freely enough to permit bark to separate readily, both in the stock and in the scion shoots.

The procedure is to cut from the scion shoot a rectangular piece of bark approximately 1½in. long by ½in. to ⅝in. wide, the bud being attached in the centre. This is done by making a vertical slit on each side of the bud and one across, above, and another below the bud from which the leaf stalk has been cut away. A patch of bark of exactly the same size is then marked off similarly on the stock ready for quick removal. The bud or scion shoot is then held firmly in the left hand, and with the thumb nail and point of the thumb the bark carrying the bud is submitted to slightly lifting pressure sideways. If the cuts are well made and the sap fairly fluid, the bud shield will come away carrying the bud. The piece of bark on the stock is quickly lifted away with the knife, and the bud shield fitted into its place and immediately tied firmly into position with a piece of twine.

Prior to doing the above, some grafting wax or paraffin wax is melted, and as soon as the thing is completed, it is painted thinly over the whole of the bud and the cut edges where it is fitted to the stock. A good grafting wax may be made by using four parts by weight of resin powdered up finely, two parts of beeswax, and one and a half parts of tallow. Dissolve the beeswax and tallow in a pot over the fire, then gently stir in the powdered resin, and boil until all are dissolved. This may be re-melted and used thinly with a brush whenever required, or may be thinned by heat and used with a knife like thin putty.

Paraffin wax is equally good, and melts at a low temperature, but any wax should be used thinly, and then be applied to cover the wounds only, and not be painted over the bark indiscriminately. The latter procedure will clog and kill the bark as well as the bud.

If scion grafting is resorted to, the nicely ripened shoots of the previous summer are selected during the winter and kept buried in soil in a moist, cold, shady place, until the sap begins to rise fairly freely in the tree to be grafted. The limbs are then sawn off, and scions carrying only two or three buds inserted by means of a form of bark grafting. For this, the lower portion of the scion is cut to a semi-wedge shape, that is, with one side cut with a longer slope than the other. A slit is made in the bark and the sides opened to admit the wedge end, the longer sloping face of which is placed in contact with the sap layer of the stock. Some successful grafters use a wood chisel, and force the face of the chisel point slantingly downwards into the wood at the base of the bark slit, and push the wedge point of the scion into this incision in the woody fibre. This gives a tight grip to the base of the scion which, when tied firmly with the twine and waxed, secures a good contact with the stock.

Walnut trees of a fairly large size should be grafted on to limbs high up, say, into limbs not more than 3in. or 4in. in diameter. Two scions can be inserted into each such stub.

These trees are best grafted or budded just when the sap is only flowing sufficiently for the operation to be performed, avoiding the time when the sap is at full flow and the tree at the height of the season's growth.

NOTES ON THE OCCURRENCE OF A NEW WEED AT SEVENHILLS.

[By Worsley C. Johnston, R.D.A., District Agricultural Instructor.]

The tabling of specimens at a Bureau meeting by one of the members led to the investigation of a small area infested with what proved to be an unrecorded weed in South Australia, if not Australia.

The specimens were forwarded to Mr. J. M. Black, who identified them as *Iva axillaris* Pursh., a North American native weed.

Reference to the literature of that country on the economic importance of the plant produced the following statement from Ada Georgia's "Manual of Weeds":—

"Name.—*Iva axillaris* Pursh. Poverty Weed.
Other English name.—Small flowered Marsh Elder.
Native, perennial, propagates by seeds and by rootstocks.
Time of Bloom.—June to August.*
Seed Time.—July to September†
Range.—Manitoba to British Columbia, southwards to Nebraska, New Mexico, and California.
Habitat.—Cultivated crops, grain fields, meadows, and waste places."

"A very pernicious weed, difficult to suppress because of its extensive system of tough, woody rootstocks which send up many fruiting stalks, causing it to form dense patches, crowding and starving all other growth. It intrudes in most crops and thrives almost anywhere, but seems to have preference for soil that is alkaline. The whole plant has a rank, unpleasant odor, causing it to be disliked by grazing animals.

"Stems 6in. to nearly 2ft. high, erect, diffusely branched and very leafy. Leaves narrowly oblong or obovate, ½in. to 2in. long, somewhat thick and fleshy, rough hairy, three-nerved, entire and sessile; the lower ones opposite, those near top alternate. Heads inconspicuous, solitary, axillary, and drooping, the central florets sterile; bracts of the involucre united into a five-lobed cup, surrounding the fertile pistillate florets, which are usually four or five in number. Achenes ovoid, flattened, sometimes peeled on one side, varying in color from green to almost black; they have no pappus."

"*Means of Control.*—Prevent all seed production by repeated close cuttings throughout the growing season. The rootstock must be starved to death, after the manner of horse nettle or perennial sow thistle, by short rotations with cultivated crops well fertilised and so well tilled that no leaf growth is permitted to store the weeds' underground stems with sustenance. Alternate with such crops as clover and rye, which may be cut often for soiling or may be ploughed under to furnish green manure for another well tilled crop."

A careful study of the above passage no doubt gives all the information necessary for its control. It will be noticed that this is achieved wholly by preventing leaf being established by the plant, for it is through the leaves that the underground portions are supplied with elaborated plant foods. The leaves are, figuratively, the lungs of the plant, and if deprived of these important organs it will die, but before this desired end is achieved it is necessary firstly to expend the supplies of foods stored up in the roots. The attainment of such results is only brought about by much care and constant attention, together with much labor in keeping down the leaf growth, but it must be remembered that if

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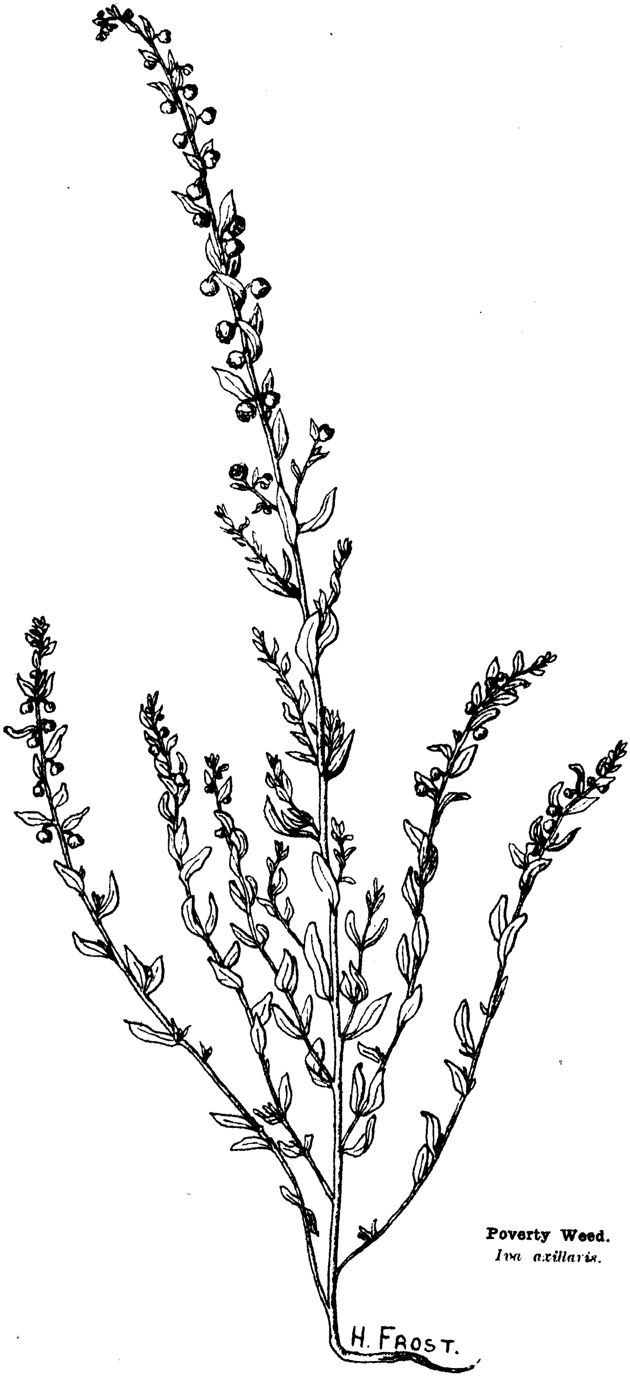
* Being November to January in Australia.

† December to February with us.



Poverty Weed.
Iva axillaris.

the plant is not checked it will spread and so reduce very materially the productivity of the land and so its value. There does not appear to be any evidence to suggest that this plant is any more tenacious than, say, hoary cress, which, it has been demonstrated, can be eradicated by careful cultivation at fortnightly intervals, continued for a period of not less than two years, so that by the adoption of such a practice it would seem reasonable to expect similar results with this plant.‡

The weed is at present known only on one holding, where it is established amongst some vines, and its ability to compete with that type of vegetation is very manifest, for all vines within the area infested are more and more reduced in vigor as the centre of the patch is approached, or, in other words, the thicker the stand of the weed the less chance have other plants of making satisfactory growth.

Under the existing location of the weed, it does not appear to be spreading with great rapidity, as it has been consciously noted for the past 8 to 10 years by the owner, which, of course, means it has been established longer than that. In that time the increase of the weed has only covered an area of about two square chains, which is not a rapid rate of increase. In this connection it is highly probable that few seedlings establish themselves because of the constant working of the stand. If this is so, the spread can only be brought about by the horizontal growth of the underground stems and the transportation of sections of the roots by the cultural implements. The latter in this case does not appear to have been a great feature in the spread of the plant. Reference in the above description of the plant to its odor is fully maintained under Australian conditions, and although no data is available as to the palatability or otherwise, it cannot be thought that animals would feed it, and if they were to graze the plants its odor would be noticeable in any edible products.

Acknowledgments.—Sincere thanks are tendered to Mr. Black for his courtesy in identifying the specimens and also to Miss Helen Frost for the readiness with which she agreed to make the illustration.

SUMMARY.

1. Poverty weed has been found at Sevenhills.
2. It is an alien of American origin.
3. It is a useless plant.
4. Its competition is so intense as to eradicate other plants.
5. It is deep rooted and grows from seeds and underground stems.
6. Eradication is difficult, but can be achieved by repeated, thorough fortnightly cutting of all above ground portions.
7. Chemical sprays may be useful if applied several times.
8. The patch as at present known is small and every effort should be made to eradicate it.

References.—"Manual of Weeds," Ada Georgia.

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‡ The possibility of its control by the use of chemical sprays may be well worth trying, and in this connection the application of sodium chlorate at the rate of 1lb. dissolved in 1gall. of water, applied to an area of 48 square yards, should prove effective. It should be done as soon as there is any showing of leaves. It must also be remembered that the spray is equally poisonous to other forms of vegetation, and care must be exercised not to let it come in contact with other plants.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the Supervision of the Department of Agriculture.

Total No. of Pens, 243—Section 1, White Leghorns—180 birds. Section 2, Any other Light Breeds—6 birds. Section 3, Black Orpington—48 birds. Section 4, any other Heavy Breeds—9 birds.

Twelve Months Test. To start on April 1st, 1932.

SECTION 1.—WHITE LEGHORNS.

Competitor.	Address.	Score to Month ending March 31st, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
S. Austwick	West Marden	(1) 215	(2) 215	(3) 138	568
C. R. Barker	Edwardstown	(4) 69	(5) 165	(6) †	234
H. Bolland	Knoxville	(7) †	(8) 193	(9) 170	363
A. Butson	Clarence Park	(10) 177	(11) 155	(12) 210	542
A. B. Carmichael	Woodville West	(13) dead	(14) †	(15) †	—
Carroll & Leedham	Forest Gardens	(16) 128	(17) 209	(18) 222	559
W. A. Carter	Glandore	(19) 165	(20) 202	(21) 160	527
W. L. Cleland	Beaumont	(22) 176	(23) 151	(24) dead	327
B. Cooke	Kanmantoo	(25) 116	(26) 182	(27) 233	531
Syd. Cooper	Edwardstown	(28) 170	(29) 138	(30) 186	494
L. H. Crawford	Grange	(31) dead	(32) 165	(33) 181	346
R. C. Crittenden	Kilkenny North	(34) 190	(35) 238	(36) 252	680
A. G. Dawes	Glenunga Gardens	(37) 236	(38) 187	(39) 192	615
A. G. Dawes	Glenunga Gardens	(40) 153	(41) dead	(42) *	153
A. G. Dawes	Glenunga Gardens	(43) 211	(44) 143	(45) †	354
A. G. Dawes	Glenunga Gardens	(46) 194	(47) 194	(48) 136	524
A. G. Dawes	Glenunga Gardens	(49) 142	(50) 177	(51) 195	514
A. G. Dawes	Glenunga Gardens	(52) 178	(53) 260	(54) 176	614
A. G. Dawes	Glenunga Gardens	(55) 219	(56) dead	(57) 193	412
T. Duhring	Mallala	(58) 143	(59) 171	(60) 187	501
Colin J. Easther	Black Forest	(61) 205	(62) 171	(63) 225	601
J. L. Edgcumbe	Plenty, Victoria	(64) 226	(65) 215	(66) †	441
H. Fidge	Clarence Park	(67) 132	(68) 183	(69) †	315
Russell H. Fox	Edwardstown	(70) 183	(71) 134	(72) 229	546
L. H. Gilbert	Glanville Blocks	(73) 107	(74) †	(75) 189	296
Keith Goldsmith	Kensington	(76) 233	(77) †	(78) †	233
A. G. Gore	Summertown	(79) 238	(80) †	(81) 205	443
A. & H. Gurr	Scott's Creek	(82) 147	(83) 207	(84) †	354
H. H. Hefford	Murray Bridge	(85) †	(86) †	(87) 200	200
H. H. Hefford	Murray Bridge	(88) 228	(89) 176	(90) †	404
Jas. Hillyer	Kilkenny	(91) 196	(92) 203	(93) 213	612
W. H. A. Hodgson	Salisbury	(94) 124	(95) 131	(96) 137	392
E. A. Lamerton	Edwardstown	(97) 134	(98) 107	(99) †	241
E. F. Lindquist	Semaphore Park	(100) †	(101) 204	(102) 205	409
Mrs. P. G. Lindsay	Croydon	(103) 169	(104) 159	(105) *	328
H. Morris	Seaton Park	(106) 180	(107) *	(108) 140	320
K. R. McPherson	Blackwood	(109) *	(110) *	(111) 97	97
H. R. Nicholls	Eden Hills	(112) dead	(113) †	(114) *	—
J. H. Oliver	Goodwood Park	(115) 192	(116) †	(117) †	192
T. B. Radbone	Colonel Light Gdns.	(118) 159	(119) 149	(120) 152	460
H. A. Rassmussen	Ethelton	(121) 211	(122) 154	(123) †	365
Woodbury Poultry Farm	Crafers	(124) †	(125) 50	(126) 186	236
Woodbury Poultry Farm	Crafers	(127) 175	(128) 228	(129) 199	602
Bruce Rowe	Two Wells	(130) 236	(131) †	(132) 189	425

Egg-laying Competition—Section 1—White Leghorns—*continued.*

Competitor.	Address.	Score to Month ending March 31st, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
Signal Hatchery	Forestville	(133) 153	(134) *	(135) 229	382
W. C. Slape	Magill	(136) 233	(137) 169	(138) 229	631
Thomas & Elson	Hawthorn	(139) 191	(140) 164	(141) 170	525
Thomas & Elson	Hawthorn	(142) 226	(143) 209	(144) 208	643
C. C. Vowels	Westbourne Park	(145) 198	(146) 209	(147) dead	407
F. F. Welford	Colonel Light Gdns.	(148) 132	(149) 145	(150) 202	479
A. P. Urlwin	Balaklava	(151) 172	(152) 176	(153) 179	527
W. Wiese	Cabra	(154) dead	(155) 154	(156) †	154
W. Wiese	Cabra	(157) †	(158) †	(159) †	—
F. J. Williams	Millswood Estate	(160) †	(161) 194	(162) †	194
W. R. Williams	Frewville	(163) 187	(164) 186	(165) dead	373
W. R. Williams	Frewville	(166) 231	(167) 122	(168) 209	562
W. Woodley	Tailem Bend	(169) 181	(170) 186	(171) 164	531
D. C. Connor	Gawler	(172) *	(173) 211	(174) 197	408
A. E. Tolhurst	Torrens Park	(175) 153	(176) †	(177) 147	300
A. & H. Gurr	Scott's Creek	(202) †	(203) †	(204) 220	220
Totals		8,414	7,741	7,551	23,706

Section 2—Any other Light Breed.

Black Minorcas.

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
V. F. Gameau	Woodville	(178) 134	(179) 141	(180) 161	436
Totals		134	141	161	436

Anconas

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
W. R. Williams	Frewville	(181) 157	(182) 146	(183) †	303
Totals		157	146	†	303

Section 3—Black Orpingtons.

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
N. F. Richardson	Woodville	(184) 96	(185) 247	(186) 208	551
Arthur Cook	Colonel Light Gdns.	(187) 232	(188) †	(189) *	232
B. Cooke	Kanmantoo	(190) †	(191) †	(192) 141	141
Jack Crago	Prospect	(193) 160	(194) 125	(195) *	285
L. H. Crawford	Grange	(196) 210	(197) 172	(198) 147	529
J. H. Dowling	Glossop	(199) †	(200) †	(201) †	—
F. J. Hudson	Prospect	(205) 206	(206) 167	(207) †	373
H. J. Mills	Edwardstown	(208) 196	(209) 239	(210) 264	699
H. J. Mills	Edwardstown	(211) 144	(212) 283	(213) †	427
J. Rawe	Seaton Park	(214) 231	(215) †	(216) †	231
B. O. Schubert	Tanunda	(217) 146	(218) †	(219) 120	266
G. Frisby Smith	Fulham	(220) 191	(221) 163	(222) 228	582
H. L. Twartz	Gawler	(223) 188	(224) 209	(225) 226	623
W. R. Williams	Frewville	(226) 209	(227) *	(228) dead	209
W. R. Williams	Frewville	(229) 202	(230) 215	(231) †	417
W. Woodley	Tailem Bend	(232) †	(233) 253	(234) 256	509
Totals		2,411	2,073	1,590	6,074

Section 4—Any other Heavy Breed.

Rhode Island Reds.

Competitor.	Address.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
H. Fidge	Clarence Park	(235) 175	(236) 190	(237) 150	515
V. F. Gameau	Woodville	(238) 200	(239) 174	(240) dead	374
W. R. Williams	Frewville	(241) 175	(242) dead	(243) 177	352
Totals		550	364	327	1,241

† Denotes disqualified under Rule 13. * Denotes did not lay during July.

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RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST EGG-LAYING COMPETITION, 1932-33.

Conducted at the Parafield Poultry Station under the supervision of the Department of Agriculture.

LEADING SCORES AT COMPLETION OF COMPETITION.

March 31st, 1933.

SECTION 1.—WHITE LEGHORNS.

Singles—	Score.	Bird Nos.
A. G. Dawes	260	53
R. C. Crittenden	252	36
R. C. Crittenden	238	35
A. G. Dore	238	79
A. G. Dawes	236	37
B. Rowe	236	130
Trios—		
R. C. Crittenden	680	34 — 36
Thomas & Elson	643	142—144
W. C. Slape	631	136—138
A. G. Dawes	615	37 — 39
A. G. Dawes	614	52 — 54
Jas. Hillyer	612	91 — 93
Teams—		
Thomas & Elson	1,168	139—144
A. G. Dawes	1,038	46 — 51

SECTION 2.—ANY OTHER LIGHT BREEDS.

Singles—		
Black Minorcas.		
V. F. Gameau	161	180
Anconas.		
W. R. Williams	157	181

SECTION 3.—BLACK ORPINGTONS.

Singles—		
H. J. Mills	283	212
H. J. Mills	264	210
W. Woodley	256	234
W. Woodley	253	233
Trios—		
H. J. Mills	699	208—210
H. L. Twartz	623	223—225
G. Frisby Smith	582	220—222
N. F. Richardson	551	184—186
H. J. Mills (5 birds competing	1 126	208—213
Teams—		

SECTION 4.—ANY OTHER HEAVY BREED.

Rhode Island Reds.

Singles—		
V. F. Gameau	200	238
H. Fidge	190	236
W. R. Williams	177	243
H. Fidge	175	235
W. R. Williams	175	241
Trios—		
H. Fidge	515	235—237
V. F. Gameau (only 2 birds competing)	374	238—240

LAKE ALBERT HERD TESTING ASSOCIATION.

RESUTS OF BUTTERFAT TESTS FOR FEBRUARY, 1933.

Herd No.	Average No of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February.	Per Cow December to February.	Per Herd during February.	Per Cow during February.	Per Cow December to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B .	19	12·96	4,464	234·95	1,059·80	236·84	12·47	50·87	5·81
6/C ..	17·96	15·96	9,630	536·19	1,864·65	454·34	25·30	84·81	4·72
6/F .	24·96	13·96	8,787	352·04	1 430·44	484·90	19·43	73·04	5·52
6/H .	26	23·46	11,594½	445·94	1,656·48	587·93	22·61	82·05	5·07
6/Y .	13·14	12	6,090	463·16	1,589·56	256·83	19·55	71·03	4·22
6/Ii	30	29	19,838	661·27	1,988·05	892·43	29·75	85·70	4·50
6/Ll	21·21	15·71	10,441	492·26	1,693·17	410·42	19·35	67·60	3·93
6/Oo	17·75	16·75	14,111½	795·01	2,699·10	633·95	35·72	121·14	4·49
6/Pp	15	10.14	6,568½	437·90	1,439·53	314·85	20·99	70·28	4·79
6Qq .	24	21·21	17,912½	746·35	2,788·66	744·03	31·00	118·06	4·15
6/Rr	29	27·11	22,629½	780·33	2,546·28	999·15	34 45	108·76	4·42
6/Tt	22	18·21	12,938½	588·11	2,173·51	551·02	25·05	95·45	4 26
6/Vv	21	20	14,686	699·33	2,527·16	678·88	32·33	115·83	4·62
6/Xx	23·21	18·61	15,367	660·23	2,223·06	658·15	28·29	92·21	4·31
6/Yy .	32·04	22·04	12,617	393·78	1,433·79	630·02	19·66	71·69	4·99
6/Zz .	27	22	17,795½	659·09	2,293·58	783·48	29·02	100·77	4·40
6/Aaa	20	17 14	2,480	124·00	830 82	145·43	7 27	45·96	5·86
6/Bbb	26 39	20·25	16,419½	622·18	2,299·05	687·59	26·05	94 45	4 19
6/Ccc	20	19 82	11,290	564·50	2,092·77	503·02	25 15	87·05	4·46
6/Ddd	22·21	19 50	15,319	689·73	2,212·94	657·59	29·61	96·73	4 29
6/Eee	25	22·46	19,679½	787·21	2,779·08	810·68	32·43	113·75	4·11
6/Fff	25·71	23·89	18,766	729·91	2,492·09	761·15	29·61	104·52	4·06
6 Ggg	24·68	23·54	23,685½	959·70	2,622·46	967·00	39·18	107·84	4·08
Means	22·92	19·38	13,613·48	593·85	2,049·56	602·16	26·27	90·25	4·42

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Journal of Agriculture, January and July, 1921.

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THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February.	Per Cow July to February.	Per Herd during February.	Per Cow during February.	Per Cow July to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E	27	24·57	14,358	531·78	4,946·45	563·34	20·86	201·54	3·92
7/H	8·18	7·18	4,340	530·56	4,804·08	212·33	25·96	242·14	4·89
7/K .	21	17·64	8,955	426·43	6,157·88	363·83	17·33	254·71	4·06
7/L .	36	33·54	19,247½	534·65	5,000·17	848·66	23·57	235·53	4·41
7/T .	14	12·57	4,450	317·86	4,197·23	219·38	15·67	190·85	4·93
7/W .	19	16	8,764	461·26	5,378·87	355·81	18·73	225·32	4·06
7/Y .	26·96	24·32	12,533	464·87	4,877·81	567·26	21·04	228·19	4·53
7/Aa	14	14	5,222	373·00	4,259·32	251·22	17·94	207·07	4·81
7/Hh	18	16·89	8,058	447·67	4,442·71	354·17	19·68	192·36	4·40
7/Kk	18·86	16·86	10,424	552·70	5,359·29	461·87	24 49	225·04	4·43
7/Mm	37	27·96	12,390½	334·88	5,919·67	509·13	13·76	230·76	4·11
7/Nn.	24	17·75	7,117	296·54	5,435·24	300·34	12·51	213·23	4·22
7/Oo	16	14	8,470	529·37	5,404·08	392·14	24·51	253·99	4·63
7/Pp	19	18·39	9,990	525·79	5,386·98	495·86	26·10	290·22	4·96
7/Qq	14·25	11·75	5,999	420·97	4,068·28	319·03	22·39	227·22	5·32
7/Tt	19	16·14	12,130½	638·45	5,243·42	525·58	27·66	235·36	4·33
7/Uu.	22	20 32	7,896	358·91	4,591·18	332·23	15·10	209·40	4·21
7/Vv	13·04	10·96	5,270	404·14	5,644·87	259·83	19·93	277·07	4·93
7Xx .	22	18	10.920	496·36	6,005·35	582·65	26·48	328·90	5·34
7/Yy.	20	16·89	6,956	337·29	4,101·00	307·63	14·86	182·81	4·46
7/Aaa	4	3·46	1,027	256·75	2,761·72	45·26	11·32	125·18	4·41
Means	19·68	17·10	8,786·55	446·46	5,036·69	393·69	20·00	228·08	4·48

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR FEBRUARY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during February.	Per Cow during February	Per Cow October to February.	Per Herd during February.	Per Cow during February.	Per Cow October to February.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	33	21·50	12,867	389·91	3,005·01	690·40	20·92	154·60	5·37
5/D .	32	24·89	13,266	414·56	2,959.46	742·76	23·21	161·62	5·60
5/E .	42·14	33·89	12,456	295·58	2,622·66	644·59	15·30	141·40	5 17
5/F .	31·86	24·71	12·955	406·62	2,950·90	625·40	19·63	144·68	4·83
5/R .	69·43	56·32	15,170	218·49	2,025·25	619·16	8·92	83·98	4·08
5/S ..	20	8·86	3,161	158·05	2,016·95	150·81	7·54	98·25	4·77
5/Y .	25·11	21·57	12,255½	488·07	2,859·10	636·36	25·34	147·42	5·19
5/Z ..	38·32	28·68	20,925½	546·07	3,214·68	983·82	25·67	153·80	4·70
5/Ee	18·14	17·79	9,061	499·50	3,886·31	468·04	25 80	190·45	5·17
5/Gg	23	18	6,473½	281·46	1,977·60	297·82	12·95	93·63	4·60
5/Ii .	30·79	27·79	15,447	501·74	3,134·06	757·75	24·61	152·80	4·89
5/Jj .	24	18·75	7,899	329·12	3,251·15	357·09	14·88	141·01	4·52
5/Kk	20	13·39	7,424½	371·23	2,348·82	313·84	15·69	105·71	4·23
5/Nn.	24	22·29	11,086	461·92	3,438·50	518·38	21·60	160·22	4·68
5/Oo	21	18·75	8,753½	416·83	3,038·14	392·05	18·67	137·86	4·48
5/Qq	20	14·04	7,553½	377·68	2,327·85	407·67	20·38	126·14	5·40
5/Rr	23·96	10·29	3,297	137·60	1,711·14	175·70	7·33	99·17	5·33
5/Ss.	17·43	16·86	6,917	396·84	2,943·83	341·01	19·56	135·83	4·93
5/Tt	11·82	10·54	4,046½	342·34	3,263·42	199·78	16·90	169·35	4·94
5/Uu.	22·93	17·36	7,258	316·53	2,294·32	328·33	14·32	102·91	4·52
5/Vv	21·68	2·36	1,916½	88·40	2,419·09	83·70	3·86	108·66	4·37
Means	27·17	20·41	9,532·81	350·83	2,697·51	463·55	17·06	130·94	4·86

THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

SOUTH-EASTERN CONFERENCE AT PENOLA.

A Conference of Branches situated in the lower South-East was held at Penola on Wednesday, March 8th, under the auspices of the Penola Branches. Delegates were present from the Penola, Penola Women's, Coonawarra, Coonawarra Women's, Mount Gambier, Kybybolite, Kybybolite Women's, Allandale East, Tatiara, Mundalla, Millicent, Millicent Women's, Kalangadoo, Kalangadoo Women's, Tantanoola, and Tantanoola Women's Branches. Messrs. S. Shepherd (Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), R. C. Scott (Supervisor of Experimental Work), H. C. Pritchard (General Secretary, Agricultural Bureau), L. J. Cook (Manager Kybybolite Experimental Farm), E. S. Alcock, H. H. Orchard, and W. H. Downes (District Instructors) also attended.

Mr. S. Shepherd delivered the opening address. The following papers were read and discussed:—''Development of the South-East,'' Mr. H. B. H. Richardson (Penola); ''Wine Making and the Viticultural Industry,'' Mr. D. G. Quinn (Kybybolite); ''Dairying,'' Mr. C. F. Provis (Penola); ''Subterranean Clover and Grass Ensilage,'' Mr. L. J. Cook (Kybybolite); ''Noxious Weeds,'' Mr. H. C. Williams (Tatiara); and ''Growing and Marketing Wattle Bark,'' Mr. T. H. Earl (Allandale East). Various questions were replied to by Departmental Officers. The following resolutions were carried:—''That this Conference brings to the attention of councils in the South-East that the noxious and poisonous weed Cape Tulip is becoming prevalent, and asks that steps be taken to prevent its spread.'' ''That crops recommended for seed in the Mount Gambier Crop Competition be published in the *Journal of Agriculture*''; and ''That it be resolved that every endeavor be made to have shipping facilities provided at one of the ports of the South-East.''

An important feature of the Conference was the Women's Session, which was attended by more than 100 delegates from Women's Branches and visitors from various parts of the South-East. The following papers were read and discussed:—''Pastry Making,'' Mrs. W. Balnaves (Penola); ''Icing and Decorating a Christmas Cake,'' Mrs. W. L. Redman (Penola); ''First Aid,'' Mrs. E. C. H. Schinckel (Kybybolite); ''Woollen Mattresses and Quilts,'' Mrs. W. Varcoe (Millicent), ''Literature in the Home,'' Mrs. L. J. Cook (Kybybolite); ''Home Training of a Child,'' Mrs. E. Telfer (Tantanoola); and ''Fruity Desserts,'' Mrs. T. Kidman (Penola). Miss E. Campbell (Inspector of Domestic Arts, Education Department) delivered an address and demonstration on ''Wool and its Uses.''

The Branches of the Agricultural Bureau in the upper division of the South-East held their annual Conference at Bordertown on April 5th, delegates being present from the Wolseley, Mundalla, Keith, Kybybolite, Mount Gambier, and Tatiara Branches.

Mr. H. G. Fisher occupied the chair, and the opening address was delivered by Mr. S. Shepherd (Advisory Board of Agriculture), who was supported by the following officers of the Department of Agriculture:—Messrs. W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. F. Anderson (Government Poultry Expert), L. J. Cook (Manager, Kybybolite Experimental Farm), E. S. Alcock, W. H. Downes, H. H. Orchard (District Instructors), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary).

A lengthy agenda included papers on ''Noxious Weeds'' (H. C. Williams, Tatiara), ''Value of Experimental Work'' (A. E. Grosser, Wolseley), ''Grasses for the Tatiara'' (L. J. Cook, Kybybolite); an address on ''Pea Culture,'' by Mr. W. J. Spafford, and a wide range of questions dealing with agriculture and livestock.

The following resolutions were carried:—"That steps should be taken to disseminate knowledge of noxious weeds through country schools and Agricultural Bureaux." "That a list of the varieties of wheat that have proved the most suitable and highest yielders in the various districts of the State, together with the time of seeding, be published in the *Journal of Agriculture* some time ahead of the commencement of seeding operations." "That the 1934 Conference be held at Wolseley." "That this Conference ask for a veterinary surgeon to be attached to the staff of the Department of Agriculture." "That the Department of Agriculture arrange for the expert officers of the Department of Agriculture to broadcast lectures through 5 C.L."

At the evening session Mr. Anderson delivered an address illustrated with lantern slides, "The Progress of the Poultry Industry."

MID-NORTH CONFERENCE.

The Gladstone Branch is one of the oldest Branches of the Agricultural Bureau of South Australia, being formed in 1888—the same year that the Bureau system was established. The first district Conference was the outcome of a suggestion made by Mr. C. F. Bauer, the then Secretary of the Appila Branch, and this lead was followed by districts all over the State.

The Gladstone Branch has continued for 46 years without any break in its continuity of work, and it was fitting that this year in the week set apart for the "Back to Gladstone" celebrations, Branches of the Agricultural Bureau in the Middle North should again hold their annual Conference at Gladstone on March 15th.

There was an excellent attendance of delegates from the Beetaloo Valley, Laura, Jamestown, Belalie North, Nelshaby, Gladstone, Wirrabara, Georgetown, Saddleworth, Yeelanna, Caltowie, Bundaleer Springs, and Redhill Branches.

Messrs. F. Coleman (member Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), R. C. Scott (Supervisor of Experimental Work), C. F. Anderson (Government Poultry Expert), E. L. Orchard and J. O. Hatter (District Instructors), A. E. Ophel (Apiary Inspector), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary Agricultural Bureau) represented the Department of Agriculture.

Mr. J. W. Prior presided, and the opening address was delivered by Mr. F. Coleman.

A wide range of subjects was discussed, in which departmental officers took part, and the following papers were read:—"Dairying," Mr. W. Roberts (Gladstone); "Honey Production," Mr. A. B. Curtis (Wirrabara).

It was decided that the 1934 Conference should be held at Laura.

The following resolutions were carried:—"That all persons using internal combustion engines in harvesting operations be required to provide efficient firebreaks around the area prior to the commencement of such activities." "That when any new legislation affecting primary producers becomes law, a resumé of same be published in the *Journal of Agriculture.*"

YORKE PENINSULA CONFERENCE.

The Weavers Branch was responsible for the 1933 Conference of Branches of the Agricultural Bureau on Yorke Peninsula, and had it not been for a serious fire in the vicinity of the township, there would have been a record attendance of delegates at Stansbury on March 22nd, 1933.

Conference was advised of the fire soon after the commencement of the afternoon session, and delegates being anxious to assist in quelling the outbreak, the Conference had to be abandoned.

Up to this time there was an excellent attendance of delegates from the South Kilkerran, Kilkerran, Yorketown, Boor's Plains, Wauraltee, Brentwood, Arthurton, and Weavers Branches, as well as a large number of the pupils from the Kadina High School in charge of Mr. McCarty.

Messrs. A. J. Cooke, S. Shepherd (members Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. A. McKenna, B.V.Sc. (Government Veterinary Officer), R. C. Scott (Supervisor of Experimental Work), R. Hill (District Agricultural Instructor), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary Agricultural Bureau) attended on behalf of the Department of Agriculture.

Mr. J. H. Bridges, Chairman of the Weavers Branch, welcomed delegates, and then left the Conference to assist at a fire which had broken out in the morning, the Chair being temporarily occupied by Mr. Shepherd, who delivered the opening address.

Included on the agenda were the following papers:—"Developing the Stansbury Scrub," L. Watters (Brentwood); "Stock Breeding," T. Rodda (Boor's Plains); "Colt Breaking," C. Rodda (Boor's Plains); "Dairying," H. E. Hegstrom (Weavers; "Ensilage," O. Jericho (Arthurton); "Wheat and Barley Production," J. J. Honner (Brentwood). Mr. Rodda's paper on "Colt Breaking" was published in the August, 1932, issue of the *Journal*, page 109.

It was decided that the 1934 Conference be held at Port Victoria, the arrangements to be in the hands of the South Kilkerran and Wauraltee Branches.

After an excellent luncheon, which was provided by the ladies of the district, the delegates were shown over the local butter factory by Mr. A. J. Cooke. On resuming the Conference, Mr. C. A. S. Hawker, M.H.R., gave an address on "Problems of Marketing Australian Primary Produce."

The evening session was occupied with an address, "Cereal and Plant Diseases," by Mr. W. J. Spafford, Deputy Director of Agriculture.

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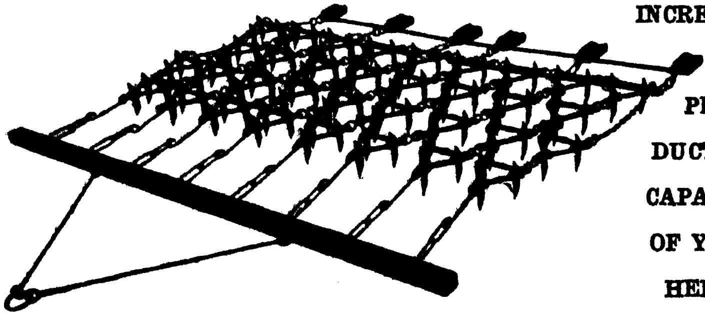

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PAPERS READ AT CONFERENCES.

MID-NORTH, GLADSTONE, MARCH 12th, 1933.

"HOW TO GROW YOUR OWN HONEY."

[*A. B. Curtis* (*Wirrabara*).]

This paper is not intended to apply to apiarists, nor, indeed, to anyone who wishes to produce honey on a commercial basis, but to be of some use to those who would grow a limited amount of honey at a very low cost.

Bees as a sideline are too often overlooked, more often quite misunderstood, and generally left severely alone. It will be assumed that the person who proposes to keep bees has had no previous experience of working bees, and has no bees at all. To begin with, I advise the purchase of one or two standard hives, complete with ten frames and ten sheets of foundation comb (full size) per hive, also a good bee smoker and a reel of bee wire. Care will be needed in handling foundation comb, particularly if the weather be cold, as it will then be very brittle. Fix the comb foundation to the wired frames, using some melted wax to get it jointed tightly to the top bar of each frame, and see that it hangs straight and even along the wires. Directions for wiring and fitting can be had fully illustrated from catalogues of beekeepers' supplies. This purchase as a first cost may seem high, and one may be tempted to use any good case; but do not be misled. Good housing is half the battle. The standard hive will serve as a pattern for more boxes if desired, but the latter must be constructed absolutely to standard, for if it is desired to sell the bees at any time, through overstocking or any other cause, any apiarist will usually purchase them, providing that they are in standard sized hives, otherwise he will not consider them at all. This is a very important point, and cannot be overstressed. Also, do not forget to paint the hives.

Most people have seen swarms of bees that could be taken during the swarming period, which is usually from September to December. Get the housewife to run up a bee veil. Use a piece of mosquito netting with an elastic hat band. The netting should reach to the waist; be sure to blacken the portion in front of the face; boot black will do; otherwise the vision will not be good. If a swarm is found hanging on a post or tree, proceed as follows:—Place the hive under or as near to the bees as possible. Give the post a knock, or shake the tree, and dislodge the bees into, or directly in front of, the hive. Upon being disturbed some few bees may be a trifle savage, but will usually soon become reasonably quiet. Blow a little smoke to meet the circumstances, allowing it to drift over the flying bees; it will have a quietening effect, but do not overdo the smoke. A little patient coaxing will soon get the swarm into its new home. When hived, the bees can be shifted to their permanent location, or do it the same evening for preference, then no bees will be lost in moving.

Select a bee site, if possible, close to house or sheds, taking care not to have them too close to passing horses or teams. It is seldom that bees will worry anyone if a couple of chains away. Select a position that receives the early sun, if possible, and not too far from water. During the first season the bees should soon fill up the frames provided, which are intended to become the brood nest, and once drawn out or fully built, need not be touched perhaps for years. Should the boxes have a flat lid, construct a shallow top story, say, about 2in. to 3in. in height, or make a gable lid or cover with sides about 3in. in height; that will give about 4in. to 6in. above the frames to be considered as the portion of the hive. When the bees have completed filling up the frames, they will proceed to fill up the lid, or above the frames; this may be cut right out as often as it is filled or partially filled, if need be. Do not spare any brood that may be in this part, as it will probably be drone comb, especially in the early part of the year.

After gathering the honey and wax it can be strained and prepared for use, saving the wax, which is valuable and can be sold or traded for further supplies of foundation comb. Should it be necessary to use heat to separate honey and wax, remember heat tends to spoil the flavor. Put honey in a vessel within another containing hot water, to keep temperature at a maximum of 212 deg. F., and for as short a time as is possible. Under this system of management four swarms will be ample. If more are to be kept, purchase an extractor. Probably two hives will provide all home requirements, if given due attention and cleaned out often when a honey flow is on. Should a swarm leave or die, look for a reason, and clean up the hive and prevent damage from bee moth, otherwise the hive will be more or less ruined. The following points are worthy of attention:—Do not handle bees on a cold day, if it can be avoided. Do not try to take honey at evenings—do it in the mornings or at midday. Do not be nervous—like animals, the bees sense it, with the usual results. Do not wear old woollens or stockings for gloves. Do not use too much smoke, and beware of the hot blast. Do not mix poor quality honey with good honey. Do not fail to clear around hives; remember the smoker contains fire, and hives are very inflammable. Do not forget to watch for the queen when cutting out honey, once seen she is easily recognised. Do not fail to become used to identifying drones, queens, and workers—it is quite simple. Do not forget to register the bees—it is compulsory.

'DAIRYING IN SOUTH AUSTRALIA.'

[*W. Roberts* (*Gladstone*).]

The value of the dairy industry to the Commonwealth for the year 1931-32 was £43,067,056. This figure is inclusive of pigs, poultry, &c. The value of butter, milk, cheese, and pigs was £33,854,426. South Australia's share of the latter figure was £1,695,602. In Australia there are approximately 160,000 employed in the industry. This figure is inclusive of some 60,000 farmers who derive their living from dairying alone. Although South Australia's share is relatively small, it is yet important enough to the Commonwealth—and State in particular—to warrant every consideration by those connected with the industry, and it is to be regretted that in this State very little consideration is given to this important—from a national point of view—branch of primary production. The trouble can perhaps be accounted for by the fact that dairying has always been looked upon as a sideline, and consequently has not been deemed worthy of consideration. This is difficult to understand, as the money derived from this once despised side line is every bit as valuable as that derived from the main source of income. In a sense, it is more to be valued as it is money received every fortnight, and ready cash is always acceptable. Possibly the return would be valued more if farmers had to wait twelve months for their cheque, as with wheat.

To obtain the best results from dairying it is necessary that the highest returns should be received with the minimum of labor and trouble. This means that two essentials to success—feeding and breeding—must be considered.

FEEDING.

This in most cases is entirely neglected, with the result that after a few months milking cows fade away in production. This can be readily understood when it is pointed out that during flush months of the year a cow of, say, 1,000lbs. weight, will eat 100lbs. of grass per day. Of this, 50lbs. goes to production and 50lbs. to maintenance of body. When feed has dried off and the cow can get only 75lbs. of grass, and grass from which a large percentage of its nutrient value has gone, 50lbs. is still used to maintain the body of the cow, which leaves only 25lbs. for production. This could be overcome by the use of ensilage, which is merely the preservation of surplus feed when the feed is at its most nutritious state. Ensilage put down at the correct period of the season, if stored carefully, will retain its high food value for quite a considerable period. The cost of ensilage from a monetary sense is very little, but it entails some labor. As a form of insurance against a dry period, ensilage has no peer. Cattle quickly learn to relish it. It has a beneficial effect upon the digestive organs. It provides the succulence necessary to a cow when she has no opportunity of grazing on succulent pasture. Over a period of 10 years, 1920-1930, there was an average of only 2,290 tons of ensilage put down per annum, and during that period South Australia's production of butter declined from some 17,000,000lbs. per annum to approximately 10,000,000lbs. per annum. And over this period it was necessary to import butter from eastern States to the value of about £250,000 per annum. A dead loss to this State of over a million and a half that should have been circulating among our farmers. Had farmers made it a practice to make ensilage a large percentage of this money would have been retained in the State, and herds would not have been depleted to such an extent. It has to be realised that to obtain the full benefit from each cow in the herd, the cows must be fed.

BREEDING.

It is a remarkable fact that nearly all farmers are aware of the desirability of having well-bred stock, and have a knowledge of the increased production to be obtained from good stock. And yet it would be safe to assume that not more than 10 per cent. of farmers are willing to endeavor to build up good herds. Here it would be well to point out the results which have been obtained in Victoria, due to a concerted effort on the part of farmers to improve their herds.

The average production in gallons per cow in 1925-6 was 343galls. per cow. Production increased as follows:—1926-7, 369galls. per cow; 1927-8, 401galls. per cow; 1928-9, 450galls. per cow. A splendid result and a credit to the energy and initiative of farmers in that State. In South Australia 1925-6 production was 317galls. per cow; 1926-7, 329galls. per cow; 1927-8, 332galls. per cow; and 1928-9 337galls. per cow. It can be seen that South Australian production was practically at a standstill, although it may have perhaps advanced a little the last season or so. There is no reason why South Australia could not show such an advance as Victoria has done. If it were possible to show the same improvement in South Australia, it would mean increased production by approximately 30 per cent. and an extra £500,000 a year to farmers in this State, with no extra labor, and with a corresponding decrease in cost of production.

Concurrently with any move towards better breeding and feeding, there must be an improvement in the quality of the raw article. This is of utmost importance, and this fact must be realised. As it is necessary that a considerable portion of the State's production has to be exported, it is well to keep in mind that we must endeavor to keep up with other States in trying to place on the world's market a choice-quality article that is fit to compete with the world's best. At present, South Australian butter is not helpful to the name of Australian butter overseas, first because the choicest butter is just choice, and only manages to grade the bare number of points for choice; secondly, because such a considerable quantity of our butter is of first grade and second grade, as the following figures will show:—

For last export season, 1932-33, South Australia exported 135,125 cases, which graded as follows:—

Choice grade	48,439 boxes, or 35.9 per cent.
First grade	70,846 boxes, or 52.4 per cent.
Second grade	11,878 boxes, or 8.7 per cent.
Pastry	3,962 boxes, or 3 per cent.

These figures are a decided reflection on the article produced by farmers in South Australia.

There is also a difference in price of choice butter for overseas received by South Australia and Victoria. Victorian butter receives on an average 4s. cwt. more for choice than South Australia, due to the fact that the quality is superior. If this defect in quality be overcome, as overcome it must be from the national viewpoint, and raise the percentage of choicest butter to 60 per cent. of output and quality on a level with eastern States, we would be approximately £20,000 per annum better off.

Fully 90 per cent. or more of this defective quality can be traced back to the farm, and is a striking testimony to the fact that farmers on the whole do not appreciate the fact that cream is a highly perishable product, and requires careful treatment. It costs no more to produce a good, clean, wholesome article than an inferior article. The usual argument advanced when quality is mentioned is that climatic conditions are against producing a choice cream. But this argument will not hold water. There is always a percentage of choice cream and if one man can produce a choice article, why not the other man? Further, the main faults with cream are—old age, dirt, and metallic cream, due to using old battered cans with tinning worn off. These defects, if abolished, would make a remarkable difference to the quality of the South Australian butter and what little trouble involved in eradicating these faults would be more than compensated for by increased returns.

DAIRYING ON YORKE PENINSULA.

[*T. E. Hergstromm, Weavers.*]

The dairying industry is a very important one for this State and for the Commonwealth as a whole, and it has been a great help to farmers in this locality to have a small dairy herd to supplement the farm income from other sources.

The cream cheque comes to hand every fortnight, and in spite of the fact that very low prices for butter are ruling throughout the world—and these values are reflected even in the local market—farmers are justified in enlarging their dairy herds to enable them to keep up a bigger supply of cream throughout the year, particularly over the slack season.

Many have large holdings and could easily milk an additional four or five cows through the flush period, and as cows do not all dry off at the same time, there would be a proportionate increase over the autumn and winter months through filling the cream cans more frequently for delivery to the factory.

A period of low prices for all dairy and farm produce seems inevitable, and the farmer who mixes his operations in regard to production will come out best. If six to 10 cows are milked on a farm when the number at present being handled is only five or six, it would be a wonderful help both to farm and factory.

Cattle are now low in price; Yorke Peninsula is famed for the quality of its grass lands, and farmers should increase their herds this coming spring; they will then get a full milking season from the cows over the period when there is a flush of green fodder, and it is when nature provides the feed that dairying can be carried on most economically.

The Peninsula may not be so suitable for dairying as the Hills Districts and the South-East, but it is nevertheless surprising the great strides that the industry has made in the last few years; production of butter has doubled itself within the past three years, which proves that dairying has been the means of helping the farmer to overcome the difficult times that he is passing through.

FACTORY WORRIES.

The factory also has its worries. Things do not always go right. Motor lorries break down, boilers blow out, and occasionally bad quality material is supplied.

When the cream arrives at the factory it is weighed, sampled, and graded carefully. All cream samples are tested by the Babcock tester on a formula set out in the Dairy Industry Act, and suppliers are invited to see their cream tested at the factory on any day convenient to them. This also applies to weighing, sampling, and grading of cream.

EXPORT BUTTER.

It has been necessary during the past season to be even more careful than usual in regard to the grading and treatment. The export season now extends almost throughout the whole year, and in order to get good keeping quality butter, which would open up well in London in eight to 10 weeks' time, it is necessary to give very definite treatment to the cream after it has been graded.

Cream is heated to a high degree of temperature to destroy bacteria, which cause butter to deteriorate on the journey to London. Therefore it is the practice at the factory to pasteurise high and then cool down as low as possible in order to bring a closer and more waxy body back into the butter when it is ready for churning. Careful grading, high pasteurising temperatures, low cooling down, and definite attention to all details to prevent contamination after pasteurising are the factors which make for success in butter making.

FAULTS IN CREAM.

There are many different types of cream received, but the faults come principally under the headings of: Metallic, Stale and Yeasty, Tallowy, Rancid.

If all suppliers would scald the cream can before putting the cream into it less metallic flavored produce would be reported. Although the cans are washed and steamed at the factory, after the lid has been on for some time the inner surface of the can becomes covered with a slight metallic acidy film, which is absorbed by the cream unless the can has been scalded; therefore, it is advisable to scald the can before putting any cream in, no matter how clean or bright it may appear.

Stale and yeasty flavors may be caused by the cream being too thin, not cooled off before putting it into the can, and keeping it too long on the farm before delivery.

Tallowy cream is usually found when the cream is too thick, and held too long before delivery. It is usually found in cream testing 55 per cent. or more.

Separators should always be taken down and washed after each separation. The action of the separator throws all the heavy sediment and sludge to the outer circle of the bowl. It will stay there until washed out by hand, and if left in the bowl overnight it becomes sour and putrifactive and will undoubtedly contaminate the next lot of fresh milk and cream put through the separator.

The quality of the cream is, after all, the most important point in dairying. What is the use of the dairy farmer going to the expense of improving his herd if he only realises second-grade quality for his cream simply through not paying sufficient attention to his separator and utensils?

PERCENTAGE OF BUTTERFAT.

The best percentage to maintain throughout the year is from 46 to 50 per cent. of butterfat in the cream. This will give good skimming results on the farm, and it is easier for the factory manager to sample, grade, and pasteurise. If cream is skimmed too thick there is always the possibility that some butterfat will come out in the skim milk for the calves and pigs. Samples of skim milk should be tested at intervals, and the factory will be glad to assist in this direction.

DELIVERIES OF CREAM.

For the greater part of the year the motor lorries make it possible for suppliers to deliver twice weekly, yet there are many instances where farmers send in once a week only. This is a double-headed penalty on the factory because the lorry is running out, and if the cans are not placed out at the roadside to be picked up there is a waste of labor, benzine, and oil. In the second place, cream, if held for a week, is much poorer in quality, being practically borderline all the time, and it increases the factory manager's difficulties.

Improving the Herd.

It is necessary for the farmer who contemplates making dairying a permanent sideline to concentrate year by year on improving his dairy herd. This can best be done by breeding from only the best of his cows and by utilising to the fullest extent the Government subsidised pure-bred bulls. Since there have been several of these bulls on the Peninsula a great improvement has been made by several dairy farmers who have adopted this practice.

Every dairy farmer should have his cows tested periodically to determine which of them are worth keeping and which are the ones to cull. With the low price of butterfat it is an expensive business to cull out cows which the dairy farmer has paid high prices for, but it would be to his advantage to know the quality of his herd, and when the opportunity offers he would then be in a position to know which of his cows to get rid of.

Feeding.

The feeding of the dairy herd is a matter of great importance, and to a certain extent has been sadly neglected by many dairymen, particularly during the dry months of the year. It is surprising that more dairy farmers have not attempted to conserve fodder in the form of ensilage. With the abundance of grass that has grown on the Peninsula for the past two years, this could have been conserved in the form of ensilage, and provide the dairy cows with succulent feed during the dry months of the year. Ensilage has become very popular with dairymen in the Hills Districts, and there is no reason why dairy farmers on the Peninsula could not give this cheap form of storing fodder a trial.

YORKE PENINSULA, STANSBURY, MARCH 22nd, 1933.

DEVELOPING THE STANSBURY SCRUB.

[*L. Watters, Brentwood.*]

There is a large tract of scrub land stretching from Minlaton to Stansbury. This land is situated within a convenient carting distance, as the Peninsula is only 26 miles wide at this part, it also has a good rainfall, quite sufficient for the growing of wheat, oats, and barley. The quality of the soil varies from first class wheat land to some that is most suitable for a flora and fauna reserve.

In the first place, the man who contemplates taking up a block should not acquire more land than he can clear and work, because a large area means the outlay of more capital in purchase money, and further, no income can be derived from scrub land until it is cleared. It must be remembered that rents, rates, and taxes have to be paid on the extra land and also that interest on capital invested will be lost. Much time and money can be saved if some forethought is given to the layout of the scrub farm. The paddocks should be made as square as possible; the cheapest way to fence in 100 acres is to make square fields.

Knocking Down Scrub.

There are various ways of breaking down the scrub to prepare it for burning. As most of it is small mallee and broom brush, I prefer a straight log about 2ft. thick from 16ft. to 20ft. long—a log of this size can be worked with 8 horses, 4 on each end, driven tandem. There is no upkeep with the flat log, whilst the roller is constantly in need of repair. Another advantage of the log is that if worked whilst the ground is wet, it will pull out many of the stumps. Where the timber is large, a specially built log is needed, one that will "climb" the trees. Burning can be done a fortnight after the scrub has been down, if this work is carried out during summer.

[*Papers Read at Conferences.*]

METHOD OF WORKING.

It is advisable to set to work with a disc plough as soon as possible after burning, so that the ashes can be turned in before the wind blows them away. The disc plough barks the stumps more than the share implement, which causes them to die more quickly. It also cuts off the shoots which are troublesome in the second and following years. Do not be afraid of over-working scrub land. Many inexperienced scrub farmers hold the opinion that because there are no weeds to kill thorough cultivation is unnecessary. This is not so, the more times the soil is turned the greater the harvest.

CROP ROTATION FIRST FIVE YEARS.

The first crop should be wheat, followed by oats, fallow, wheat, oats. Always burn the stubble, this is the best way of killing the shoots, and if there is not enough straw to carry a running fire, use a fire rake. The growing of oats is advocated, not only for their commercial value, but for the purpose of combating take-all. Grow only varieties of wheat that produce a fair amount of straw, such as Ford, Big 8, and Nabawa; short-strawed wheats are difficult to harvest and do not give a large enough fire to scorch the shoots properly.

Do not use tractors, they are only a rich man's toy on good land. Do not buy unnecessary machinery. Always practise the strictest economy, and do not expect to work at a profit for the first 10 years.

STOCK BREEDING.

[*Thomas Rodda, Boors Plains.*]

A strange confusion exists in the minds of most men as to the general principles that should guide the stock breeder. Should the chief consideration be the individual excellence of the sire or dam, or their breeding? When does line-breeding merge into in-breeding? How is it that many of the most historic stud animals have been the result of in-breeding, When is it advisable to in-breed, and when dangerous?

Again, does pregnation from a sire of another breed affect the dam's subsequent progeny. In other words, would a Clydesdale mare be impaired as a Clydesdale breeder through having a foal to a blood stallion? Some go so far as to be openly sceptical of the value of breeding altogether, and say that exceptions are so common that it is feeding, not breeding, that matters. Yet it must be admitted that stock owners owe an untold debt to the care and persistence of the breeders who evolved noted strains. Even during the last few years there has been a remarkable advance in quality and productive power. Moreover, the understanding of essentials costs no money. Nor is the exercise of care in breeding expensive. Millions are lost yearly because of careless indifference on the part of stock breeders. All need not be stud breeders, but all can and should aim at quality in breeding. Few fields show more room for improvement. Without any attempt to be exhaustive, a few fundamental principles and practical suggestions may be laid down.

LIKE BEGETS LIKE.

The principle that "like begets like" is the most generally accepted of all theories of breeding. There are many and important exceptions to the rule, but generally speaking, it is a sound principle upon which to work. If one consistently culls from his dams inferior animals and chooses for sires those showing most prominently the characteristics he requires, he must substantially improve his flock or herd. In choosing a sire it is always wise to buy him as nearly as possible in his natural condition. Many young sires are so artificially forced that their development appears abnormal. Often, however, this development does not continue; the youngster so full of promise turns out to be a common animal when fully grown. The mistake is often made of purchasing at shows precocious youngsters whose development is often the result of extreme forcing. If the learner will develop a critical eye for points of frame, constitution, and style of carriage, and will learn to distinguish between fat and flesh, he should soon know how to choose the sire that will improve his herd.

CORRECTIVE MATING.

But perfect animals are seldom bred and more seldom bought. Side by side with the principle of breeding only from the best, it is important to practice "corrective mating." Practically all animals have definite and distinct faults. Many have good points equally definite and distinct. The art of the breeder lies largely in judicious mating to correct faults and so perpetuate good points. Only experience and close study will develop the instinct that enables a breeder, by corrective mating, to build up the type he desires.

SELECTION.

Closely allied to the practice of corrective mating is that of selection. The history of breeding is full of illustrations of how men have selected towards a certain standard, until they have evolved an animal altogether superior to that from which they started. This has been well illustrated in the latter day history of the Australian Merino. The Middle North Merino flocks of South Australia were noted as big, plain-bodied sheep, carrying good fleece of great length, and strength of character. They were lacking, however, in other regards. Often they lacked density, particularly along the back; nor was the quality of the wool all that could be desired. To correct these tendencies, the Canowie Pastoral Company and other big sheep breeders, secured from New South Wales outstanding sires of Wanganella blood. These sires, bought by the enterprising breeders have greatly improved the stud sheep of the State. Without losing the features for which South Australian Merinos were previously noted, they added an excellence of quality and an important density of the fleece, greatly increasing its value.

IMPORTANT CONSIDERATIONS.

Two considerations are important in the matter of selection. Firstly, selecting characteristics that are not merely the outcome of environment. Much time and patience are wasted in trying to fix the unfixable. Many characteristics are purely the result of circumstance, and cannot be transmitted from one generation to another. Secondly, it is important to concentrate on certain definite characteristics; often on one point alone. Not that other points must be neglected. The faddist who seeks after one point, ignoring all else, is almost certain to fail, but concentration is nevertheless essential. Supposing one decides that his herd is faulty in several points, say lacking in depth, "handle" of flesh, and style of head. Naturally he will seek a sire strong in all these points. But such accommodating sires are not easily found. Moreover, it is important that the sire shall not impair other points which he desires to retain in the herd. The wisest plan will be, therefore, to buy an animal as evenly sound as the pocket will allow, providing that he has the particular point most desired strongly emphasised. Even then it will take years of patient work before the weakness has been made good. If one tackles all the faults at once, one is likely to fail all round.

VALUE OF PEDIGREE.

While it is true that upon the whole, like begets like, yet this is but part of the truth. As a general principle, one must insist that the individual animal be strong in essential points and that, no matter how an animal be bred, it does not pay to use a mean specimen; yet keen attention must be given to the pedigree. In stock breeding, as in other matters, much of the future can be foretold by a study of the past. Learn to examine a pedigree carefully. See that there are no weak links, particularly in the nearest two generations. Breeders are adepts at laying emphasis upon the points in which the pedigree is strong, but more often than not maintain discreet silence where there is weakness. Always examine, therefore, the record and breeding of the grand dam on the dam's side. This is usually the weak spot. Many writers on questions of breeding complain of the emphasis placed upon the breeding of the dam on the maternal side, as printed in most pedigrees. But it would be an impossible task to print the genealogical tree in full, and usually one can take it for granted that the sire is a specially picked animal in quality and breeding. This is less likely to be so in the case of the dam.

LENGTH OF PEDIGREE.

While it is important to place due emphasis upon ancestry, there can be little doubt but that with some, length of pedigree has become almost a fetish. Many breeders place great stress upon families. A certain beast is in great demand because he or she dates back to some mystical cow of some 15 generations ago. Galton's law of heredity can only be taken as a guide when applied to a large number of cases—many exceptions will occur in individual cases. Nevertheless, it is of interest as indicating the average influence of the generations. Galton teaches that the character of the immediate parents have, on the average, as much influence as that of all the other ancestors put together. He describes the effect upon the progeny thus:—Each parent's influence as one-quarter, each grandparent's influence one-sixteenth, and each great grandparent's influence one sixty-fourth. But while the importance of length of pedigree can easily be over-estimated, it is vitally important to find out all one can of the parents and grandparents of a sire. Personally inspect the parents wherever possible. If a beast has points common to both his parents, the probabilities are that he will throw true in such points. The extent of prepotency to be expected from a sire can be gauged largely by a look into his ancestry.

IN-BREEDING.

The question of in-breeding, or breeding between close relations, has always been a fruitful field of controversy. Many urge that there is no surer way to the ruin of a stud. And yet it is an established fact that many of the greatest improvements to stock have been due to in-breeding. The importance of selection and the use to which in-breeding can be put is well illustrated in the story of how Robert Bakewell built up his Leicester sheep and Longhorn cattle studs. Until the middle of the 18th century both sheep and cattle in England were of very poor class. They were not raised primarily as meat producers, but the beast was used for the plough and the sheep for its wool. The industrial revolution altered this. Increased population meant increased meat consumption. Bakewell saw a good market ahead. He set himself to evolve fast maturing breeds. He secured large, long-woolled sheep from Yorkshire and Lincolnshire and his cattle from Derby, and set to work upon a process of selection and in-breeding. It is not known just what principles he adopted, but it is established that he used no outside blood for 20 years. He appears to have followed in-breeding rather because he could not buy what he required outside than because he adopted the principle as such. The result was remarkable, particularly in the case of his sheep. He also obtained great success with his cattle, and it was not until Colling Bros.—some years later—evolved the Shorthorns on much the same lines that the breed he established was improved upon. Watson adopted the same practice with the Aberdeen-Angus stud. Many of the present big studs of Australia have also been built up as the result of a modified form of in-breeding.

What is to be gained by in-breeding? By this means outside factors are excluded and the qualities of the parents are more truly reproduced in the child, or, as James Watson puts it, "In-breeding tends to reduce the amount of variation due to the recombination of characters, and thus to fixity of type." In-breeding, coupled with careful selection, would appear to be safe, but otherwise to be dangerous.

LINE BREEDING.

Line breeding is a modified form of in-breeding. The difference lies largely in the degree of relationship. Many competent breeders are loth to use a sire that does not in some way show blood relationship. When a ram representing an entire change of blood is purchased, he is often used upon a few selected ewes, and from these a sire selected for more general use. The extent of the variations introduced is thus lessened.

TELEGONY.

The theory has been deeply rooted for many years that a dam will be influenced as a breeder of subsequent young by the impregnation from a sire of another breed. Many cases ascribed to telegony would be more truly described as reversions to type. In any case, should there be adequate reason for crossing any particular animals, one need not be deterred by fear of the influence upon subsequent generations.

THE VALUE OF ENSILAGE ON THE FARM.

[*O. D. Jericho, Arthurton.*]

Ensilage is not a new method of conserving fodder, but has been in existence for many years. Last year, towards the end of August, I put down a small stack of clover and self-sown oats. For making ensilage the crop must be cut more green than ripe. I cut hay tracks of barley for ensilage 14 days after the heads appeared. The crop must be carted to the stack as soon as it is cut. In making stacks, put them in well sheltered places, because cold winds from one side have a tendency to tip them over. Stacks should not be too big; it is hard to halve a stack and if too big there is too much waste and it dries out very quickly. When building, the middle should be kept higher than the edges so that when the stack is completed it is pointed at the top.

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The middle settles, because most of the weight comes direct on to that part of the stack. Stones were used for weighting and stacked to about 15in. thick, and a railing put around to prevent the stones falling off.

The making of ensilage is simple, but the work must be carried out quickly, although stacks should be allowed to stand one day between carting, because they rise quickly and are likely to fall with quick heating.

FEEDING OF ENSILAGE.

Ensilage is not suitable for horses, but it is the best feed for cows when no green fodder is available. When milking cows that have been fed on dry chaff are changed over to ensilage, in six days one will notice the extra quantity of milk and cream produced. I have also found it very good for pigs. Generally speaking, it is the only feed for safe storage, it is fire-proof, and no vermin will live in it.

Finally, it is a feed that will last for years. It is on record that ensilage has been kept in pits for 17 to 20 years and opened in perfect condition. It is one of the cheapest methods of stacking fodder against droughts. If every farmer put up a few small stacks each year there would not be any shortage of feed in bad years. Clover, barley grass, and even Scotch thistle will make good feed when conserved in the form of silage.

[*Mr. Spafford, in commenting on the paper, said the ensilage stack should be built in the reverse way to that used for stacking hay. The sides of the stack should be kept high—the top of the stack being built in the shape of a saucer—in order to keep the moisture in the stack.*]

PRACTICAL OBSERVATIONS AND RECOMMENDATIONS OF WHEAT AND BARLEY PRODUCTION.

[*J. J. Honner, sen., Brentwood.*]

This paper is based upon some 50 years' experience. To farm successfully there is as much scope for intelligence and initiative as there is to be a success in any other business or profession. Farming is at all times subject to entirely different routine by way of altered seasonal conditions, not known to the farmer until they are upon him, which is vastly different to the nature of other callings, which year after year can be met with much the same rule or adoption. It is the perplexity and uncertainty of the whole business that makes it so attractive to those who are born with an ambition to surmount difficulties. At the same time there are certain conditions that will assist to a successful issue in spite of the prevailing uncertainties.

FALLOWING.

The usual course to adopt is to fallow barley stubble land. I favor a good burn if possible, and then during March and April this land should be cultivated if practicable, if not, ploughed with a light fallowing plough to a depth of 2½in., and ploughed or cultivated again after having been fed down by sheep after seeding, in suitable weather —not too wet—and harrowed soon after being ploughed or cultivated.

If weed germination continues excessively, cultivate again in October. If "laid down" land is to be fallowed, do so immediately following completion of seeding, harrow and work it from then on as before-mentioned, at all times avoiding, if possible, working any or all fallow while it is extremely dry, other than to kill weeds about to seed. The fallow can be worked too often as well as too seldom, with almost equally bad results. Much will depend on the season that is to follow, which is then unknown. If fallow is over-worked and a wet season follows, it has a tendency to set hard and create a sickly plant. In light soils there is the possibility of drift; leave the fallow if possible in neither a fine nor a rough condition. Strike the happy medium so long as there are no weeds on the land, which even then can be overcome considerably by the aid of a few sheep. After summer do not work the fallow unless for the purpose of weed destruction, or breaking down roughness, preferably after a rain.

SEEDING.

Pickle effectively, preferably formalin for wheat, and bluestone for barley. Either adopt the float system or do it on the floor. If the wheat is perfectly free from smut, was well pickled the year before, and winter seeded under favorable conditions—fine weather, dry surface, and damp seedbed—it is fairly safe to sow without being pickled, unless wheats liable to smut are being used. Wintry, sloppy, wet conditions create smut generally, as found in the later crops sown. Barley should never be sown unpickled.

Quantity of seed to be used varies according to the stooling qualities of wheats. At the same time there are good grounds for suspicion that wheat is sown too thick more often than too thin, and the same applies to barley. Crops adjust their thickness according to soil and season, and to overdo this only means more heads and less grains. For fast growing wheats—Gluyas, King's White, and Waratah—sow 75lbs. of seed, and for the ordinary stooling or later varieties, 60lbs. to 65lbs. of good clean seed. Both wheat and barley seed requirements can be estimated at 4 bags to 10 acres, ready to sow bags. May seeding for wheat and June for barley is recommended provided conditions are suitable about the 1st of May, because an early start means an early finish. Commence seeding about 7 to 9 days after a reliable rain. If rain holds off until the 15th of May and there is a large area to crop, do not wait if the fallow is dry and reasonably free from weeds. Sow unpickled clean wheat, with 80lbs. of super. The idea is sometimes held that early seeding is liable to excessive growth of straw and less grain. This can be effectively overcome by judiciously feeding back with sheep, with no fear of injury and every prospect of benefit, even up to August, providing the season appears promising. I have experimented on these lines even in dry seasons and am convinced of the success attained. Neither wheat nor barley bogged in does well generally. Apart from this, the fallow through late seeding is delayed, the horses become weary and thin and not fit to proceed with fallowing sufficiently early to do a good job. It is better to put in less and do it well. It is the yield that counts, not the area. In view of the possibility of the barley market going down below a payable proposition I have been experimenting on a second wheat crop rotation—wheat following wheat on fallow, and barley for the third crop. This will give a two-third wheat proportion and a one-third barley. If judiciously farmed, fair results can be obtained by seeding the land intended, about the end of May, when in a damp condition, with say 75lbs. Waratah, Gluyas, or King's White, with 150lbs. of 45 per cent. super. The extra cost of super is only 2s. 6d. per acre above average cost, and the lesser cost in the working of the second crop as against fallow under ordinary conditions will offset the difference in yields, to say nothing of the greater cropping area on farms, at a lesser cost in land taxation and other costs.

VARIETIES.

Regarding best wheats to grow, this subject leaves space for much thought, in so far as soil conditions vary, so that experiment is necessary before any real guide is obtained. No wheat can be thoroughly tested in one year. Out of nine varieties sown this year, the order of preference would be as follows, with little to choose between the first six kinds:—(1) Currawa, (2) Ranee, (3) Nabawa, (4) Waratah, (5) Nugget, (6) Late Gluyas, (7) Ghurka, (8) King's White, (9) Free Gallipoli. For land in the Weavers district I would suggest:—No. 1 quality land, deep soil, sand or rubble loam, Nabawa, Currawa, Waratah, Ranee, Nugget, or Gluyas. No. 2 quality land, red stony or sheet rock nature, Waratah, with Late Gluyas and Ranee to fill the other places. For scrub land with deep sandy soil, fairly free from stone, I suggest Nugget, Currawa, Ranee, Waratah. In experimenting with wheats never sow a large area of an unknown or untried variety at first. There are many pitfalls ahead of the experimentalist, and men of this type are a very real value to any district, in so far as they experiment with their time and money for the benefit of their neighbors. The question of cleaner wheat as regards freedom from barley is long overdue, and is telling against the value of our wheat overseas, more so than is generally believed.

Merchants or agents have no desire to dock farmers' wheat, they both would much prefer if there was no docked wheat, and both often strain every point possible to evade so doing. Barley in wheat can be minimised by farmers hand picking a portion required for seed each year. If they do not do this, they should purchase clean seed from a reliable grower and not complain at the 4d. or 6d. extra charge per bushel for such wheat.

SOUTH-EASTERN, PENOLA, MARCH 8th.

DAIRY CATTLE, TREATMENT, ETC.

[*C. F. Provis, Penola.*]

I propose to commence this paper taking as an example a calf three days old.

At three days old take the calf from its mother and feed it on separator or skim milk; it can be brought on to the skim milk by gradual process if required, that is to say, whole milk can be mixed with skim milk, each day making the percentage of skim milk greater until no whole milk is used at all.

In hand-feeding the calf the greatest care has to be exercised in cleanliness. Never leave a bucket of milk in the calf yard; remove all milk from the yard after the calf has been fed and immediately clean the feeding vessel in readiness for the next feed. Milk will go bad quicker than most things, and dirty vessels will almost certainly bring on scours in the calf, sometimes so bad as to be fatal. The milk should be warmed to about blood heat or the same heat as it is when taken from the cow; never use milk straight from the separator, as it has a lot of gas in it and will be very detrimental to the calf. Let the milk cool and settle from the separator, and warm it up again after the froth has gone from the top. Feed the calf three times a day and not too much at a time for the first week or so, about half a gallon is a pretty fair drink for a young calf; the quantity can be increased as the calf gets older.

After about a week the calf will commence to nibble a bit of grass. When it shows the tendency to feed I usually give about a handful of chaff and a cupful of bran. It is a good plan to keep a little rock salt in the feed boxes for all cattle, young and old. I also feed a little sweet bone meal; this is excellent for all female animals, and will not do any harm to the male animals. It is most essential for the female, as it is a splendid preventive against the much dreaded milk fever. If heifers and cows have a 2oz. tobacco tin full of bone meal in the chaff about two or three times a week they will be most unlikely to contract milk fever, and in the case of a cow or heifer in calf, the bone meal will assist the strengthening of the cow's internal machinery and enable her to calve without any undue loss of blood. Cows in milk should have a little bone meal at least twice a week.

Calves can be weaned off milk at about four months if necessary, but a little longer will do them good, and at the age of 6 to 8 months in the case of Jerseys and 8 to 10 months in the case of other breeds, the heifer can be mated. This will bring her in with the first calf at from 15 to 19 months old; she will then be quite ready to commence her earning capacity for her owner, and she should be brought in with a calf once in every year, as she will do a better job by continuity of breeding and milking than she will do if she is allowed to have much spell. Keep plenty of good feed up to them and they will work all the time, right on to 20 years of age, and in some cases longer. Some cows have given their best returns at 13 years of age and upwards. Give her about 6 weeks spell before, and allow her to go about 6 weeks after calving, that will make three months, and the other nine she is carrying a calf.

CALVING.

When a cow is approaching calving she should be watched to see that she has no difficulty. Sometimes the calf will be presented in the wrong position, and the cow will need assistance. The calving process is somewhat as follows:—About 12 hours before calving the cow will show two hollows, one on each side of the butt of the tail well up to the rump; she will become restless and agitated and will sometimes be very excited and run about quite a lot. Then the waterbag will appear. This is a bag about as big as a small football and of a creamy or light color. This bag should burst within 20 minutes after its appearance, and within another few minutes the two front feet and nose of the calf should be visible. Probably the front feet will be seen first, with the bottom part of them towards the ground; the nose will then appear on top of and between the two feet. If this is so, the cow will usually do the job without any assistance, as the calf is in the correct position and will soon come away. If only one foot appears, the calf may have to be pushed back and the other foot brought into position for calving, or possibly the head may be turned back, in which case the calf should be pushed back and the head brought into the right position. It may be that the hind feet will come out first. In that case endeavor to get it out hind legs first. After calving, the cow should be milked out as soon as possible. After she has had about an hour, during which time she will clean her calf, she will also eat all the stuff she cleans off her calf and most often will eat her afterbirth as well. The authorities are in favor of letting them have it, and I agree, as it appears to do them no harm, and has a tendency to bring the cow on to her milk better and in healthy condition; probably it is one of Nature's treatments.

There are times when an animal will have her calf in such a tangled position that all the aid one can give will not save the situation, but such cases are very rare, and mostly the difficulty will be one of those described.

After coming in allow the calf to run for three days with its mother. Milk the cow twice every day to make sure that her milk bag is quite cleared out at those times; the three days will take away all the first milk from the cow and will build up a wall of resistance in the first bowel of the calf (known as the Rumen) which will materially help when the calf is put on to the separator milk. I recommend plenty of warmth and a dry shed for the calves.

MILK FEVER.

Prevention being better than cure, feed plenty of bone meal and help prevent milk fever. However, if your cow gets milk fever, she will probably go down pretty quickly, and will also become unconscious, as the fever goes straight to the brain and paralyses the animal. First treatment: Milk her right out, then give a good hot foment to the udder, using it with Castile soap and plenty of massage. Be careful to dry the udder thoroughly after the foment, then rub it well with about 55 per cent. lard and 45 per cent. turpentine mixed together. After this application milk her right out again, then pump up the udder with pure air. I do not tie the teats. If the thumb or finger is held over the end of the teat for a minute or so after pumping, the teat will seal itself and prevent the air from escaping.

After this treatment some noticeable improvement should be seen within an hour, after which time the operation can be repeated if necessary. An opening drench is also a good help in the case of milk fever, but never attempt to drench an animal that is not fully conscious, or much harm may be done. If you are satisfied that the animal is conscious she will be capable of taking a drench, but if she is down with eyes glazed and takes no notice of anything do not drench until she has regained consciousness. She will be groggy after she gets up and will probably stagger, but this will leave her after the fever works off, and she will soon come on to her milk afterwards.

MAMMITIS.

This is a rather bad disease and one that gives the dairyman a lot of trouble. Mammitis usually attacks the best cows, and usually the best quarter will be the first one affected. It is always advisable to keep an eye on the milk strainer after a cow has come in for say a week or two, because that is one of the first places that mammitis will be detected. If after straining the milk a few tiny little yellow specks about as large as small grains of wheat or smaller are noticed, one can be pretty sure that the cow has mammitis, and if caught in this early stage, a hot foment and good rubbing with the mixture previously described will often break it up and bring her right. If, however, it is of longer standing and hard—if the udder or one or more quarters of it have become inflamed and hard, and do not give much milk, then in addition to the foregoing treatment, an injection of streptococci and straphlococci prepared by Mr. Hamilton in Sydney, New South Wales, is recommended. This injection is given anywhere other than in the udder. I usually give it just behind the shoulder, and it is only put under the skin and allowed to spread. There should be some noticeable improvement in seven days from the time of operation, if not, the process can be repeated with a little stronger dose, the third injection to be a little stronger still. (Three injections are the maximum number required, after which an animal is considered to be immune from mammitis). From experience I believe this to be correct, but unfortunately the Government will not so far recognise this treatment as being of any use. However, practice beats theory, and I have been using this stuff long enough to know that in most, if not every case, it effects a permanent cure.

BLOAT.

This is an accummulation of gas in the first bowel. The gas develops very readily from subterranean clover or any such very rich and highly succulent fodder. Bloat will sometimes kill an animal in an hour if not removed. In mild cases the animals appear slightly swollen on the near or left side between the last rib and the hip. They labor slightly in the breathing and are uneasy. If the attack is not bad there are several ways in which it can be dealt with. The first and easiest is to stand the animal with its head up-hill if possible and massage the swollen part. Soon the gas will move about inside the animal; it looks something like a football roaming around inside the cow, and by keeping up the rubbing process for a little while, the animal will probably belch up wind or gas. This will relieve the gas and the animal will usually get the rest out on her own account. The next easy treatment is to put some Stockholm tar either on the nose or down the throat. The tar is pretty sure to let the gas out, and will not be at all detrimental to the animal. A dose of soda is another good thing, and I believe some people put a stick through the animal's mouth and keep the mouth open, but I have neither seen nor practised this method. If the animal is in an advanced stage of bloat, an operation will probably be necessary, and if so it requires to be performed quickly, as bloat will kill in an hour in some cases. This operation is performed with a trocar and canula. Insert the trocar with the canula in and remove the trocar, leaving the canula in the animal to let out the gas. After becoming about normal, the canula can be removed. This operation requires to be performed with the utmost cleanliness, as it is easy to push foreign matter into the animal and possibly bring on some serious complications.

[Papers Read at Conferences.]

SUBTERRANEAN CLOVER AND GRASS ENSILAGE.

[*L. J. Cook, Manager Experimental Farm, Kybybolite.*]

Ensilage made from our improved pastures can undoubtedly be regarded as the best for local conditions because it can be easily and economically made, and it also materially aids in the handling and management of both pastures and livestock.

I have had the opportunity of handling quite a varied number of plants with which to make ensilage, and that produced from good clover and grass is equal in quality to that made from crops such as maize, peas, wheat, oats, or barley, and makes a really first class silage.

Its economic value lies in the ease with which it can be gathered and made. It lends itself to the making of stack ensilage better than other plants, because the thinner and shorter stalks allow the stack to be built very evenly and regularly, so that the mass settles nicely without undue incorporation of air. Consequently the loss from a well-built stack of this ensilage can be reduced to a minimum, and is little greater than that obtained from the sides of many silos.

There are very few silos in the South-East, and the present is not a time to advocate their erection, especially when we have a means of conserving our surplus pasture growths at little more than the cost of some solid manual labor.

The method I recommend is to first develop good healthy thick pastures containing a nice mixture of clover and grass. These can be obtained by the liberal use of superphosphate applied to well established and managed pastures. Such pastures can be grazed well until the early spring, when, if closed to stock, will invariably make a quick luscious growth that will yield up to 10 or 11 tons of green-feed from the

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mowers in October or November. Mow off the pasture when the bulk of the grasses has commenced to flower. Do not wait until the clover flowers, otherwise grasses may be too ripe and dry. It is necessary to have the mower in first class running order. See that the knives are kept well sharpened, the ledger plates sound, and the divider board is strong and functioning correctly for the crop. The green-stuff should immediately be put into the stack, so that no more should be cut each day than can be handled into the stack. Select a well drained area on which to build the stack, and if possible protected from prevailing winds. Should the stack be erected in the same field as the pasture is cut, the greenstuff can be very easily handled by means of the push rake for carting to the stack position. This saves considerable labor in forking. Also by using a grab worked on a mast and boom, heavy pitching and forking to stack can be avoided. A single horse grab will convey 1cwt. to 1½cwts. per minute on to the stack.

The following materials are required for mast, boom, and grab:—

Mast—19ft., 5in. x 5in., 2 15ft. stays, 3 x 3; boom—1/9ft. 1/7ft. 3 x 2½, 54ft. 1¼in. cable, 12ft. boom rope or cable, 3-4in. pulleys, guy rope and stay block; grab—40ft. 1½ x ⅜ iron, 30in. chain, bolts and rivets.

Circular stacks are the handiest to build, and one 15ft. in diameter will hold 80 to 90 tons of greenfeed, which should make 60 to 65 tons of sound quality ensilage. Build the stack well; that is, spread the material very evenly over the stack. Keep the outside higher than the centre and tramp the edges really well. Place about 6ft. to 8ft. depth of greenstuff on to the stack each day. Keep the sides well raked down, as this helps to seal the sides and saves considerable waste. Protect the stack from heavy winds as much as possible whilst it is being built. When completed leave the top slightly rounded off (dome shaped), and weight well with logs, stone, or soil at least 1cwt. per sq. ft. Be sure to place the weight well out on the edges. A strip of netting run round the top edge will be effective in holding on bags of soil.

In cutting off some of the heavy spring growth, the pastures are improved for stock in that objectionable seeds of barley and brome grasses are removed, and allowance is made for a nice fresh growth of aftermath, prolonging the season of green pasture. Ensilage can be cut earlier than meadow hay, and consequently a better aftermath is obtainable after an ensilage cut. By using the mower on these pastures, for either ensilage or hay making, much waste is avoided, and a greater number of stock can be carried on the same area.

The greatest value of grass ensilage lies in it as a means of providing succulent feed for stock at times of the year when it is very needful. Grass and clover ensilage have a comparative narrow nutritive ratio of 1 to 4.5 or 1 to 5, and are particularly valuable as a food for dairy cows. To obtain best results from milking cows they require correct feeding, and they cannot secure correct feeding without a supply of succulent feed at all seasons of the year. There is no easier or cheaper means of providing this succulence than as grass ensilage. At most our improved pastures can only be expected to provide sufficient succulent grazing for about six months of the year, and as stack ensilage it is quite a simple matter to conserve some of the spring flush of feed, and feed it back to the cows so soon as the green pasture fails, and continue until sufficient young fresh grass of the next season is available. Not only can cows produce better, when properly fed throughout the whole year, but an even supply of cream can be maintained to the factories, and the factories in their turn should command a better position in the markets.

As an instance of the advantage to the farmer of producing cream during the summer and autumn months of the year, I will quote prices received at Kybybolite.

During the last four seasons, ending September 30th, 1932, the average price of butterfat received at Kybybolite from January to June has been 15.86d. per pound, whereas for the same years from July to December the average price has been 14.26d. per pound, a difference of 11 per cent. in favor of the summer and autumn months. In earlier years, for instance, the five seasons 1921-26, the difference in price was greater, being 17 per cent., whilst the average for nine seasons has shown a difference of 14 per cent.

Considering the production of cows, we find that at Kybybolite, where we have always endeavored to supply sufficient succulence, combined with a balanced food ration, the monthly average return per cow has been consistent. The average monthly return during the past four seasons has been lowest in April with 36s. 7d. per cow, and highest in July with 42s. 6d. per cow, and that for the six months January to June, the average return has been £11 15s. 3d. per cow, and £11 17s. 7d. per cow for the other six months, July to December. We find that the highest average production of butter fat has been in September with 35.92lbs. per cow, which at an average price of 13.3d. per pound obtained that month, gives a money receipt of 39s. 10d. per cow, whereas the month of March shows only an average production of 30.40lbs. butterfat per cow, which at 16.5d. per pound, equals money value of 41s. 10d. per cow. These are results of all cows in the herd, that vary in age from 2 to 12 years, and whose lactations are at different stages.

Examine from another position and consider the results from individual cows. Take three average cows that have had four lactation periods commencing at the same time during each of the past four seasons.

Lorna commenced her periods in February each year, Snowbell commenced in May, and Nancy commenced in September.

Taking nine monthly periods for each cow, we find that Lorna in her four periods, February to October, produced 1,354lbs. butterfat. When the supply for each month of the year is valued at the average price for the respective month we find that the 1,354lbs. have been worth £86 8s. 5d. at Kybybolite or 15.32d. per pound.

Snowbell's periods were from May to January each season, and for the four years she produced 1,250lbs. butterfat. This valued at the respective monthly price returned £76 4s. 3d., or 14.63d. per pound.

Nancy's periods were from September to May each season, and she produced 1,262lbs. butterfat. This returned a value of £77 11s. 7d., or 14.75d. per pound.

The average price of butterfat received at Kybybolite for the four years was 15.06d. per pound. Hence we see that the butterfat from Lorna was worth ¼d. per pound more than the average, whilst that from Nancy and Snowbell was worth approximately ¼d. and ½d. per pound less than the average. The reason of differences is due to the former producing the bulk of her fat when the price was high, and the latter produced most of theirs when the price was not so high.

Summarily, if each cow had produced the same amount of butterfat, say 350lbs. per annum, the one that freshened in February would have produced in value 20s. 1d. more than the one freshening in May, and 16s. 8d. more than the cow freshening in September for her nine-monthly period.

Feeding good succulent food such as ensilage enables a cow freshening in February to produce 40lbs. to 50lbs. fat monthly for the autumn. Also, it helps a cow freshening in May to produce heavier during May and June, and also to expand her production in December and January at the end of her period. For the September cow it is essential to secure good production during the last five months of her period.

In conclusion, the amount of ensilage required varies according to the size of animal and the amount of production given. Approximately 25lbs. to 30lbs. daily is needed, and at the most a cow should not need more than 180 days feeding, so that 2 tons of ensilage per cow, or approximately 3 tons of green pasture put into the stack, would be sufficient for one year's allowance.

Ensilage is also a valuable sheep feed; 2lbs. to 3lbs. per day each will aid to keep them in good health during the dry time of the year if there is no green feeding available.

The following tables show the production of the cows referred to above, the price of butterfat, and the butterfat production per cow at the Kybybolite Experimental Farm:—

VALUE OF PRODUCTION OF LORNA, FOUR PERIODS, 1928-32.

Month.	Total Production Butterfat. lbs.	Price. d.	Value. £	s.	d.	
February	215	16.62	14	17	9	
March	188	16.50	12	18	6	
April	141	15.94	9	7	4	
May	167	15.07	10	9	9	
June	146	15.24	9	5	5	
July	131	15.18	8	5	9	
August	133	14.01	7	15	3	
September	127	13.30	7	0	9	
October	106	14.48	6	7	11	
	1,354		£86	8	5	15.32d. per lb.

VALUE OF PRODUCTION OF SNOWBELL, FOUR PERIODS, 1928-32.

Month.	Total Production Butterfat. lbs.	Price. d.	Value. £	s.	d.	
May	209	15.07	13	2	6	
June	191	15.24	12	2	7	
July	183	15.18	11	11	6	
August	149	14.01	8	13	11	
September	150	13.30	8	6	3	
October	121	14.48	7	6	0	
November	101	13.65	5	14	11	
December	79	14.93	4	18	3	
January	67	15.82	4	8	4	
	1,250		£76	4	3	14.63d. per lb.

VALUE OF PRODUCTION OF NANCY, FOUR PERIODS, 1928-32.

Month.	Total Production Butterfat. lbs.	Price. d.	Value. £	s.	d.	
September	227	13.30	12	11	7	
October	231	14.48	13	18	9	
November	194	13.65	11	0	8	
December	159	14.93	9	17	10	
January	112	15.82	7	7	8	
February	104	16.62	7	4	0	
March	90	16.50	6	3	9	
April	72	15.94	4	15	8	
May	73	15.07	4	11	8	
	1,262		£77	11	7	14.75d. per lb.

General average price for four years .. .. .. 15.06d. per lb.

Prices of Butterfat at Kybybolite.

Year.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Average.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
1931–32......	12·25	11·50	9·90	10·00	11·10	12·00	12·00	10·25	10·00	11·25	11·25	11·25	11·06
1930–31......	12·00	10·25	11·50	14·50	15·75	16·00	14·75	13·50	12·75	12·50	11·75	11·75	13·08
1929–30......	20·05	18·40	19·05	19·71	20·13	19·36	19·25	19·49	19·75	18·89	15·13	13·49	18·56
1928–29......	13·64	14·47	19·27	19·09	19·51	18·66	17·77	17·04	18·45	18·09	17·90	16·70	17·55
Mean	14·48	13·65	14·93	15·82	16·62	16·50	15·94	15·07	15·24	15·18	14·01	13·30	15·06
Mean—													
Jan.-June .						15·86							
July-Dec. ..						14·26							
1932–33......	9·54	9·00	8·95	8·73									

Butterfat Production per Cow per Month at Kybybolite.

Year.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Total.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1931–32......	36·81	31·96	29·49	29·45	28·39	28·13	27·97	30·57	31·28	32·12	32·45	34·31	372·93
1930–31......	36·08	34·49	30·55	29·18	30·17	28·95	28·06	32·83	33·33	33·39	33·82	32·65	383·50
1929–30......	31·33	32·71	30·55	28·27	26·12	35·08	30·33	33·91	33·85	34·69	34·64	38·84	390·32
1928–29......	33·78	31·26	28·64	25·68	25·78	29·45	23·83	28·17	33·98	34·18	34·03	37·86	366·64
Mean	34·50	32·60	29·81	28·15	27·61	30·40	27·55	31·37	33·11	33·60	33·73	35·92	378·35
Mean—													
Jan.-June .						178·19							
July-Dec. ..						200·16							
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£ s. d.
Mean value ..	41 8	37 1	37 1	37 1	38 3	41 10	36 7	39 5	42 1	42 6	39 5	39 10	23 12 10
Mean value—						£ s. d.							
Jan.-June .						11 15 3							
July-Dec. ..						11 17 7							

[*Papers Read at Conferences.*]

A REVIEW OF THE WINE INDUSTRY WITH REFERENCE TO PROSPECTS OF VITICULTURE IN THE SOUTH-EAST.

[*D. G. Quinn* (*Kybybolite*).]

Scattered throughout Australia are thousands of holdings which combine vine growing with grazing, farming, or dairying, and the wine cellars range from thatched sheds to elaborate factories. The possible articles of export in the early days were practically limited to wine, whale oil, and minerals, and so we find that the early colonists gave much attention to viticulture in the fertile Hunter River Valley, north of Sydney. They did not develop an export trade, however, as the fast-growing towns of Sydney and Newcastle absorbed all their produce. Later, gold mining near Albury encouraged some alert graziers in the neighborhood to cater for the miners' thirst and extend the industry of viticulture further south, and so we find that, many years later, Victoria, with the town of Rutherglen as a centre, superseded New South Wales as the largest vinegrowing State, while Drs. Kelly and Penfold and the graziers Reynell, Angas, and Richmond, were practising the industry as a hobby in South Australia.

With the outbreak of phylloxera in Victoria, the industry in South Australia finally became the most important in Australia. The value of the viticultural trade now represents 12 per cent. of the value of total primary production in South Australia. From this it will be seen that the centre of the main activity has moved three times in the past 130 years, due to cheaper production being found possible in the new areas. The western foothills of the Mount Lofty Ranges now hold pride of place.

Viticulture, at to-day's prices, when practised under favorable conditions yields far higher returns per acre than grazing, farming, or dairying at any time, and there is but little suitable land still available for planting north of Adelaide; in fact, much that is planted will be forced out of production in due course and replaced with land more carefully selected. Owing to indiscretion and the highly profitable nature of the business, the vineyard areas have been extended rather too far from the hills into the 17in. to 18in. line of rainfall. The soil here, often a poor white sand to start with, has in many cases become vine-sick, depleted of humus, and perhaps charged with injurious salts. Another fault of these light rainfall areas is that the ripening of the fruit is too rapid, and a harsh, unattractive wine is the result.

This fault can be hidden by manufacturing unduly sweet wines, but the high degree of sweetness is not popular with the discriminating public either here or in England, and this point limits trade expansion. Finally, although the climate of the area now under vines is decidedly moderated by the altitude of the Mount Lofty Ranges, these districts are 400 miles nearer the equator than the approved European areas.

Turning to the South-East, we find that the degree of latitude of Naracoorte more closely corresponds with the northern degree of Oporto. The rainfall of the Naracoorte district, although inferior to some of the vine areas of the Adelaide hills, is actually superior in practice, as is proved by the fact that subterranean clover flourishes in the district, whereas it fails to complete its cycle of growth in the present vine areas. This is accounted for by the mildness of the South-Eastern climate, the absorbent and flat nature of the soil, and the characteristic clay subsoil. A little doubt must be entertained as to whether the fruit would ripen sufficiently for some classes of wine, although I may point out that the deep, heavy-colored wines demanded 15 to 20 years ago are not sought after to-day. This change has largely accounted for the failing demand for spirit felt by districts growing grapes for that purpose.

As regards the soil for vines, good drainage is the first essential. A sandy loam overlying ironstone rubble with the clay at 15in. to 18in. is difficult to fault, particularly if it receives a preliminary enrichment of eight to 10 years of clover and heavy stocking. The white sands of the yacca and stringy bark country would produce wines, particularly dry white wines, of perhaps the highest quality, but the yields would be light and probably unremunerative. As regards white wines, there is a very definite shortage of them, even to-day, when over-production is the cry.

The cost of establishment of vineyards may be worked out at a very high figure if interest on costly land is charged, together with wages and plant specially purchased for the purpose, but this figure can be kept very low indeed by using farm plant and spare time. As regards annual costs and returns, the following may illustrate the matter briefly. An acre average of 30cwt. of Shiraz at £8 a ton represents a gross return of £12 an acre. The annual items, interest on capital, pruning, cultivation, picking, and delivering may each be set down at £1, making £5 in all, leaving a net revenue of £7 an acre, which is a phenomenal return for agriculture at the present time.

Australia ranks very low in the numerous list of wine-producing countries of the world. Up till about 1920 eight to 10 million gallons were produced annually, all of which was consumed locally, with the almost negligible exception of half a million gallons exported to England. By and since 1924 the production figures have jumped 100 per cent., and the vintage average now ranges between 15 to 20 millions gallons. The quantities used within Australia and exported to England are practically equal. Unfortunately, a small surplus has been accumulating from year to year, and it is now viewed with apprehension, even though it is difficult to say whether the present depression has injured or improved the demand abroad for the relatively cheap Australian wines.

The English public now recognises the quality and reliability of these wines, but even so, Australian wines can only compete on the British market with the assistance of British preference and a bounty raised on the same principle as the Paterson butter scheme and the dried fruits export system.

Though there has been a constant surplus of wine we see that sales have increased 100 per cent. in the past 10 years, and grounds are not entirely lacking to say that this figure may again be doubled, for obviously 90 per cent. of the Australian public could with advantage to their health and spirit consume a gallon of wine a year. At present they have not the money. Many types of excellent wine have been made in Australia, but speaking in broad terms the Australian manufacturers have only exploited the market for one simple type of wine which, incidentally, has been found to sell without the aid of propaganda. Other types of wine certainly are made, but the existing demand for them is so very small and irregular that they reach the public at prohibitive prices, and are consequently ignored and unknown.

The wine manufacturing fraternity may be blamed for making no attempt to educate the Australian public and so fully utilising the home market; but they have two reasons. Firstly, they are satisfied with the magnitude of their present enterprise which, incidentally, has grown by leaps and bounds; and secondly, they have no faith in the standard of education oenologically and aesthetically of the great Australian public.

In a period of depression such as we are now passing through, the luxury trades must expect to suffer, but I may point out that for 10 to 15 years after the Napoleonic wars England suffered severely from trade depression, after which she enjoyed a long era of prosperity, during which the demand for wine was never greater, and it is quite possible that history in this case will repeat itself.

The conclusions which may be drawn from the above are:—

There are possibilities for viticultural development in the South-East.

There is a probability of the market expanding with the coming of better times.

That many new and successful centres have been opened up by people experimenting with winemaking as a hobby.

[*Papers Read at Conferences.*]

GROWING AND MARKETING WATTLE BARK.

[*T. H. Earl (Allandale East).*]

It would seem to the average person that the wattle tree is more ornamental than useful, but the object of this paper is to show that it combines both these qualities. As soon as it has fully blossomed and the bloom has been followed by the seed it begins to be useful, because its bark is then at the best stage for stripping, since the warm sunshine has induced the usual strong flow of sap. Wattle bark has only one commercial use, that of tanning skins.

Growing of Wattle.

It would seem that there may be a return to horse power on farms, which would mean more harness and more leather goods in use and more wattle bark to tan them. I think a man having an area of sandy, ferny country could not do better than try a few acres of wattles. In ferny country the seed can be broadcast on the land, which is then burnt off. The burning seems to assist in the process of germination. About half a pound of seed per acre should be sufficient. Rabbits must be kept down on the sown area, or they will eat off the small plants as soon as they appear above ground. I have had little experience of sowing seed by hand, but I understand that the seed should be steeped in boiling water before sowing in order to hasten germination.

Varieties.

There are three varieties in my own district; these are the Silver, Black, and Adelaide —sometimes called Gumeracha. The silver wattle has a leaf like an acacia, and its bark is white on the outside, hence its name. It grows quickly to a good size, but its bark is of low quality. The black wattle grows more slowly and has a narrow leaf. Its bark is quite black on a mature tree and is quoted first grade on the market. The Adelaide wattle as we call it (because it was brought from the hills and is not a native of the district) has a broad leaf, grows rather slowly, and has thick bark even when young of good quality. In these days of small profits and quick returns I think it would pay to sow this variety in preference to the others. It matures quickly; the bark is tough and stringy, consequently it can be taken off in good lengths, thereby speeding up the job of stripping.

Having established a paddock of wattles, it is best to keep the stock away from them, as cattle will nip the tender shoots and retard the growth. As they grow they should be thinned out, and the lower limbs trimmed off, the idea being to induce them to grow a straight trunk. Wattles are not subject to much disease, the worst parasite being a small white grub, which burrows under the bark and will sometimes ringbark the tree and kill it. There is no remedy; the only thing is to strip the tree at once, otherwise the bark will be lost.

Stripping.

There is no set time when a tree should be stripped. Some, on account of having more room to grow, will mature more quickly than others, but as a rule it does not pay to strip them under seven or eight years of age. If stripped earlier, the bark will be thin, light, and of poor quality. When stripping time arrives, say, about October, first of all we must procure some bark rope to tie the bundles, and equip ourselves with the necessary tools, which fortunately are few. An axe and a barking iron are all that is required. The barking iron should be made of steel, otherwise it will bend out of shape. A piece of old binder sheaf-carrier makes a very good one, it being light and strong. The tree is ringbarked with the axe about 3ft. 6in. from the ground; this determines the length of the bundles which are to be made. The bark is then opened with the iron and pulled downwards in strips, the broader the better. The bark above is then also taken off as far as can be reached. If the tree is tall and straight it will pay to chop it down to strip its top. If it has some side limbs it is an easy matter to climb up to finish topping. We usually carry a short ladder around with us for this purpose. As to the quantity which a man could strip in a day or week, a lot depends on the trees, which vary a good deal, and of course, much also depends on the man. In good wattles, the average man should be able to strip 10 bundles, each weighing ½cwt. when dry, in an ordinary day, or about a ton and a half per week. The price of stripping varies a good deal. I have paid as high as £3 10s. per ton, but this year it was from 35s. to £2. The work is not laborious, but on account of snags, &c., one's clothes are rent and torn, and often one's knuckles are barked as well as the trees.

BUNDLING.

To make a bundle we must first take two pieces of the bark rope about 3ft. 6in. long, tie a loop in one end of each, and lay them on the ground straight out, about 18in. apart. Now take the bark we took off the butt of the tree and lay it on the bands side by side, with the sap side up, until the bands are covered. Now lay on the longest pieces of bark, doubling any that are too long, and put the doubled end right out to the edge. Now gather the small stuff and place it just where the bands will catch it when tied up. Roll the bundle up and tie as tightly as possible, because the bark will shrink a good deal. Put a few pieces of wood under the bundle; this will facilitate drying and prevent the bark becoming mildewed through lying on the damp ground.

MARKETING.

As soon as the bark is dry, which will depend upon the weather, it should be carted together into stacks. It will then hold its weight better and facilitate loading when one is ready to send it to market. Like all primary producers, the bark grower has no say in what he will receive for the fruits of his labor. He must take what he is offered. We have seen the day when we could get £11 per ton for bark, but this year we are receiving just half that amount.

SOUTH-EASTERN DEVELOPMENT.

[*H. B. H. Richardson* (*Penola*).]

Geographically, the lower South-East is situated some 200 to 300 miles in a south-easterly direction from Adelaide, our main transport system being a narrow gauge railway to Wolseley. We are very fortunate in the fact that we enjoy a good rainfall, in fact droughts are unknown. While fortunate in this respect, our big misfortune is our distance from the big cities of Victoria and South Australia, transport charges eating considerably into our profits. I understand our population has increased very slightly during the last decade, our surplus population migrating to the cities.

In the development of the South-East drainage is of utmost importance. We have only to look at Millicent as an example of what drainage is capable of doing. I firmly believe that if the land is drained so that the water can be taken away faster than it accumulates, large tracts of country will be rendered fertile. Drainage has proved successful in other countries with soil conditions not nearly so good as thousands of acres of our low lying country situated between the ranges. This may not be a payable proposition for a term of years, but posterity would undoubtedly reap a rich reward. Given that the Government intend to drain the South-East effectively, how will they deal with the lands thus drained? Much of this land is held by private enterprise and much is Crown land. Land can be taken up under several tenures, but I think the perpetual lease is the most effective means of land settlement. The land is not alienated. It will carry in perpetuity any added value due to drainage. Posterity will take a hand in paying off the drainage debt. The fact of this land being let on the perpetual lease system means that settlers will not require so much capital to start with, and what capital they have will be put into improvements, fertilisers, &c. They will not have the heavy instalments to pay as in a closer settlement agreement to purchase, which is spread over a period of 30 years and more. I know personally of an agreement to purchase block converted to a perpetual lease. This man has done remarkably well, and has spent capital developing his land, which he would not have been able to do had he had big commitments to meet. The difference in Government rent was spent in fertilisers, which are the life blood of our South-Eastern land.

Wool is not paying cost of production, and many thousands of acres should be carrying crops of various kinds. We are told we have some very rich country in the South-East, and much bad. Has this so-called second and third rate country ever been tested to see what it will produce? Unfortunately our Government field officers have had no opportunity of demonstrating what capabilities this country has. Our so-called worthless lands are producing some of the finest tobacco grown in Australia. A few years ago this would have been scoffed at. We have large areas of stringybark bracken fern country, which as we know grows pines to perfection. Will it produce anything else? The writer states without fear of contradiction that it is the ideal land for fruit production. All kinds of fruits will flourish, and to those who have the mind to do so the planting of walnuts would be a very payable proposition. On the easterly aspects the orange and lemon should do splendidly. I am convinced that this disrated land would grow lucerne to perfection. I am also of the opinion that many South-Easterners are suffering from too much land, that they have not been making the most of their opportunities. The grass grows and the sheep eat the grass. As for growing lucerne, Sudan grass, chou mollier, turnips, &c., this is not thought of. One of the finest examples of private closer settlement in South Australia and one of the most successful was the Coonawarra settlement, situated on some two square miles of country, which until the collapse of the wine industry was putting some £30,000 annually for excise into the Commonwealth coffers. This settlement produces many tons of dried fruit annually, and many thousands of cases of apples, which are exported overseas.

Potatoes can be and are produced in large quantities in South-Eastern districts. Until we have a Grading Act on the Victorian lines, and more attention is paid to digging the tubers, so long will the poor prices continue. Why is it that Victorian potatoes command a bigger price than South-Eastern? Simply a matter of confidence. Irrigation will play a big part in the development of the South-East, particularly in regard to lucerne growing. Water at shallow depths can be obtained in most parts, and with the latest sprinkling methods is not expensive. We have many advantages in the South-East, but our transport problem is the bugbear. Our fat lambs lose their bloom, and our pockets several shillings per head. In conclusion, I would like to see an alteration in our land laws. Under the Closer Settlement Agreement to Purchase Act the land is saddled with an extra £1 or so an acre, which puts a big burden on the man who is allotted these repurchased estates. If, instead of an increase, repurchased land, say, bought at £5 per acre, were allotted at £4 instead of £6, it would give the allottee a chance to make good. The Government are certainly losing a pound an acre, but a prosperous man on the land is an asset to the country. He is feeding the railways with his produce, while the struggling man is a burden on the community.

[Papers Read at Conferences.]

SOUTH-EASTERN, BORDERTOWN, APRIL 5th.

THE VALUE OF EXPERIMENTAL PLOTS.

[*A. E. J. Grosser* (*Wolseley*).]

A Conference of Agricultural Bureaux is a most appropriate gathering at which to discuss a subject of this nature. The time is at hand when producers must earnestly consider how to get the best results out of the land, and grow more bags per acre without any increase in acreage, by putting more work in on a smaller acreage and improving the yield. That can only be done by early fallowing and using selected seed. This will give better results and higher yields. This paper is written to encourage someone locally to do this valuable experimental work. Departmental officers and others are ready to help at any time, nature is doing its part, and farmers must do their share. There is room for improvement; let us try and adopt the better system of farming. Our neighbor grows from 36bush. to 40bush., let us try and do likewise, and not be led away with that belief that the land is worn out and too old. In most cases our methods are too old, and there is still room for improvement. That does not only apply to the growing of wheat, but also to draught stock, cattle, sheep, poultry, and pigs.

Mr. Grosser said that three car loads of members of the Wolseley Branch inspected the experimental plots conducted by the Victorian Department of Agriculture at Salisbury, Victoria, and were very much impressed with the work that was being done. The time of fallowing experiments created a great deal of interest, and the following figures showing a comparison over a five-year trial of winter and summer fallowing were given:—

	Winter Fallow.	Summer Fallow.
No super	23bush. 6lbs.	22bush. 0lbs.
½cwt. super	25bush. 1lb.	24bush. 4lbs.
1cwt. super	24bush. 7lbs.	23bush. 2lbs.
1½cwt. super	24bush. 7lbs.	23bush. 6lbs.
2cwt. super	24bush. 6lbs.	22bush. 6lbs.
Average	24bush. 5lbs.	23bush. 2lbs.

Very low rainfall was experienced during some of the years covered by the experiment, and the good fallowing methods were one of the main factors in obtaining such good results.

In 1920, when the trials were begun, Federation was the most popular wheat in the Wimmera, but since then 28 different varieties have been tested on the plots and several of them have proved more prolific than this variety. For the past nine years Free Gallipoli has yielded 3bush. more than Federation, and has now become the principal wheat grown in the Western Wimmera. Rajah—an early maturing variety—has given the highest yields, but has a tendency to shed its grain. Other wheats which have out-yielded Federation are Ranee, 4 H., Wannon, Mogul, and Ghurka. The last-named is a very short-strawed wheat, and should prove a good wheat in the Tatiara.

In the manurial trials, the test conclusively proved that July sowing gave most general satisfaction in the Horsham districts, but was not advisable in the Nhill district, nor for the Tatiara. There was an increase in the early sowing by 3bush 1lb.

The wheats tested in the Variety Trials, with the yields per acre, were:—Rajah, 42bush. 4lbs.; Ghurka, 37bush. 3lbs.; Ranee 4H., 36bush. 4lbs.; Nizam, 34bush. 2lbs.; Free Gallipoli, 32bush. 9lbs.; Mogul, 32bush. 1lb.; Wannon, 31bush. 4lbs.; and Federation, 29bush. 8lbs. The plots were seeded with 75lbs. seed and 1cwt. super. Manurial trials have been conducted at Salisbury for 12 years, and results show that the heavy dressings of super may be advisable in wet years. In average years an application in excess of ½cwt. per acre is not profitable, especially on black flats. At Rainbow, where manure was applied on a measured portion of a plot, there were 94 plants with 323 heads, and on the unmanured plots 98 plants with 243 heads, a 30 per cent. increase on the manured portion.

Salisbury sowing tests are of a six-years duration. The early June sowing average for five plots was 40bush. 4lbs. per acre; early July average sowing, five plots, 37bush. 3lbs. per acre. This paper and the particulars of the plots at Salisbury have been given in the hope that plots on similar lines will be started in the wheatgrowing districts covered by the Conference and be of help in our district. We have the land and the rainfall, and we have our instructors to give us any information that we may require. It is hoped that this paper may raise some discussion and be of value to the men on the land.

NOXIOUS WEEDS.

[*H. C. Williams* (*Tatiara*).]

There is a noticeable realisation by landowners in the Tatiara area of the importance of controlling useless weeds, even though some of the species are not on the compulsory list for South Australia.

Anomalies exist between Victorian and South Australian legislation regarding what is a noxious weed, and as our district is on the border of the two States, the position is somewhat unsatisfactory. A comparison of the lists for the respective States shows for instance, that Patterson's Curse (Salvation Jane), hoary cress, and charlock, and others of which we have very limited quantities at present, are under the ban of the law in Victoria, but are free to spread broadcast in South Australia.

There appears to be scope for protective steps to be taken to safeguard landowners on each side of the border from the common enemy. In certain parts of our State Salvation Jane has run riot, and possibly, in the absence of better herbage, may be tolerated rather than put the affected landowners to the expense now of attempting its eradication.

Here, however, we can very well do without weeds of inferior merit whose habit, moreover, is to smother the nutritious grasses and clovers. Salvation Jane is quite useless for cattle, and should be kept out, and hoary cress cannot claim any tolerance whatever.

Under the Noxious Weeds Act, 1931, section 7, the Governor is empowered to declare any plant to be a noxious weed for the purposes of this Act throughout the whole or any portion of the State, or to remove any plant from the schedule, or to either ban or exempt any plant under any special circumstances, such circumstances being specified in the regulation.

Thus the way is open for our own district to endeavor to protect itself from any particular plant by stating a case to the authorities setting out the desirableness of controlling any such particular plant that does not already appear in the schedule of the Act.

The Tatiara District Council has had occasion recently to request the administrators of the Victorian Weed Act to give stricter attention to Bathurst burr near the border. Likewise we are entitled to protection from the infestation of weeds of interstate origin through the medium of nursery parcels of trees or plants.

Whether any supervision over nurseries infested with hoary cress and such insidious weeds, does not at present exist, and if so, whether it is sufficiently stringent might with advantage be ascertained, because there are grounds for suspecting that hoary cress established itself here per medium of nursery stock.

We only have a little of this weed here at present, and on a restricted area where it is being rigorously dealt with, but if it is permitted to arrive indiscriminately from Victoria it might attack us from many other quarters of the district, with dire results.

South-east district councils are not all above reproach for permitting noxious weeds to spread in their own and adjoining districts on both sides of the border.

The Naracoorte star thistle is almost as well known in places as the famous caves at Naracoorte. Unlike the caves, however, it does not remain at home, as landowners are being constantly reminded where the Act is observed. With dense masses of thistles going to seed along the Naracoorte roadsides motor cars and sheep carry the seeds for miles.

In a recent article on Cape tulip in the local press mention was made of enlisting the co-operation of the Lacepede District Council, within whose borders this scourge is rampant. Upon making inquiries it would appear that its eradication in that area is hopeless, because of its extensive hold over thousands of acres. We can sympathise with those who are so afflicted and who would probably have to abandon their land if the law relating to destruction of weeds was enforced in their case. At the same time steps to check the dissemination of the tulip might be taken. Owing to its pretty bloom tourists are attracted to gather bunches of it and also to carry away and plant the bulbs. Being readily propagated, through both these means it is for ever extending its baneful scope.

A suggestion has been made that prominent notices should be erected on the roadsides near the tulip areas, setting out the poisonous nature of the plant and warning the public against carrying it farther afield. As a body of agriculturists in a comparatively clean district we would be justified in following up that suggestion and asking that everything possible should be done to restrict the spread of tulip.

Every landowner in this fertile district, where weeds could easily become a serious menace if neglected, will realise the importance of this subject, and is invited to submit any questionable species of weeds for identification.

Vigilance, promptness, and thoroughness on the part of inspectors and landowners allied to a spirit of co-operation, will have maximum results. If on his journeyings an inspector sees a few weeds, instead of passing them by and issuing a notice, which will entail the farmer searching a mile or two of his paddocks and roads, he can chop them out, and if necessary, carry them away for burning.

The farmer, on the other hand, should not require a notice if he finds he has noxious weeds on his farm, or adjoining roads, but should destroy them forthwith.

The definition of ''destroy'' in the Act means grub and burn. This is more essential after the weeds have flowers or seeds on them. To merely cut them at that stage and leave them to blow about the ground, is to cause future trouble and work. The best stage for destruction is before flowering. Always grub deeply for lasting results.

Victorian Schedule of Noxious Weeds, October, 1932:—Perennial Californian Thistle, Sacred or Blessed Thistle, Bathurst Burr, Charlock or Wild Mustard, Star Thistle, Malta Thistle, St. Barnaby's Thistle, Syrian Thistle, Saffron Thistle, Hemlock or Wild Carrot, Common Bind Weed, any plant named Dodder, Egyptian Dodder, Artichoke Thistle, Nutgrass Sedge, Thorn Apple, Patterson's Curse or Purple Bugloss or Salvation Jane, Water Hyacinth, Californian Stink Weed, Digger's Weed or Sheep Weed, Cape Tulip, Tutcam, St. John's Wort, Hoary Cress, Musk Weed, Dropping Prickly Pear, Wild Radish or Pointed Charlock, Sweet Briar, Blackberry Bramble, Stinkwort, Ragwort, Apple of Sodom or Kangaroo Apple, Spreading or Three-flowered Nightshade, Furze, Merians Bugle Lily, Chinese Shrub; Boxthorn permitted in hedges 4ft. 6in. high by 2ft. wide.

South Australian Schedule of Noxious Weeds, October, 1932:—Cotton Bush, Wild Onion, Saffron Thistle, Innocent Weed, Purple Star Thistle, Yellow Cockspur, Yellow Cockspur, Canada Thistle, Hemlock, Dodder, Thorn Apple, False Caper, Cape Tulip, St. John's Wort, Buffalo Burr, Apple of Sodom, Californian Burr, Bathurst Burr, Horehound, Dyer's Weed, African Boxthorn (except in hedges existing prior to Act), 7ft. x 4ft. 6in.

Hoary Cress and Horehound have now been declared noxious weeds for the district of Tatiara, at the request of the local district council.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held at the Blackwood Experimental Orchard on Wednesday, March 29th, there being present Messrs. H. N. Wicks (Chairman), R. H. Martin, F. Coleman, J. W. Sandford, P. J. Baily, S. Shepherd, Dr. A. E. V. Richardson, and H. C. Pritchard (Secretary). Apologies were received from Messrs A. M. Dawkins, A. J. Cooke, J. B. Murdoch, and Professor A. J. Perkins.

LEAVE OF ABSENCE.—The Secretary was instructed to apply to the Hon. Minister for three months' leave of absence on behalf of Mr. J. B. Murdoch, who intends accompanying the Dried Fruits Display on the s.s. *Nieuw Holland* to the East.

LAYERING OF VINES.—Resolution from the Conference of Lower North Branches:—"That this Conference requests the Department of Agriculture, in conjunction with the Council for Scientific and Industrial Research, to conduct experiments in Mr. Geo. Wishart's garden (Angaston) by layering three rows of currant vines to compare with those now under rejuvenation experiment." It was decided to ask the Chief Horticultural Instructor to report on the resolution.

CAPE TULIP.—Resolutions from Penola Conference:—(1) "That this Conference brings to the attention of councils in the South-East that the noxious and poisonous weed Cape Tulip is becoming prevalent, and asks that steps be taken to prevent its spread." The Secretary was instructed to bring the resolution to the notice of the Local Government Department. (2) *Crop Competitions.*—"That crops recommended for seed in the Mount Gambier Crop Competition be published in the *Journal of Agriculture.*" The Secretary reported that arrangements would be made to give effect to this resolution.

NEW BRANCH.—Conditional approval was given to the formation of a Women's Branch at Laura.

NEW MEMBERS.—The following names were added to the rolls of existing Branches:—Pygery Women's—Mrs. A. R. Kammermann, Mrs. G. Duggin, Mrs. E. Bean, Miss M. Hodgson, Miss A. Bean; Roseworthy—H. Altmann, E. Schwartz; Mount Gambier—J. E. Morphett; Mundalla—C. R. Scown, H. Scown, J. Sabie; Stanley Flat—M. L. Nolan, C. Clark, R. Giles, L. Glassenbury; Saddleworth Women's—Mrs. B. Kahl; McLaren Flat—Albert Air, Jack Shearing; Nelshaby—K. Nolan, C. L. Pearce; Milang—H. Vivian; Parilla Women's—Mrs. B. C. Pearce, Mrs. L. G. Wright; Wasleys Women's—Miss Lucy Hewlett, Miss Braun; Tantanoola—Joe Chant; Mundalla Women's—Miss L. Gooding, Miss E. Gooding, Miss I. Hillier, Miss M. Kemp; Maltee—Colin Chant; Penwortham—A. H. Gersch, R. Whetstone; Rosedale—W. George; Wynarka—S. F. Blight, R. B. Campbell, R. G. Anderson; Overland Corner—R. C. Delaney; Wasleys Women's—Mrs. J. Hancock; Belvidere—C. W. Ansell; Coonawarra Women's—Mrs. R. J. Childs, Mrs. W. Mitchell, Miss E. Hoffmann; Greenock—Len. Zimmerman; Frayville—W. Faehrmann, H. Ramm, J. O. Bottroff, H. Kretschmer; Kapinnie—Jas. Doudle; Balumbah—Jack Rowe, G. Rowe, T. J. Griffin; Laura—R. H. Reichelt; Longwood—A. E. Bone; Hanson—A. Hermes; Elbow Hill—L. M. Wake, P. C. Wake; Goode Women's—Mrs. B. Klau; Coonawarra—M. Geraghty; Goode—L. Bowman, R. Geeke; Greenock—J. Wisdom; Buchanan—L. M. Roebuck; Tweedvale—H. N. Coumbs.

No. of new members, 64; No. of present members, 8,375; No. of Branches, 326.

DAIRY AND FARM PRODUCE MARKETS.

Messrs. A. W. Sandford & Co., Limited, reported on April 1st, 1933.

Butter.—Production in this State declined rapidly last month, as usual for that period of the year. With the dry weather conditions ruling the proportion of lower grades increased, and the position at present is that although there is a surplus of first and second grade butters which has to be exported to London, choicest quality is short and increasing importations have therefore to be made each week to meet the demand. The London market continues very weak, but in spite of this local values have been well maintained because of the shrinking supplies. Choicest creamery fresh butter in bulk, 1s. 1½d. Prints and delivery extra (these prices are subject to the stabilisation levies). Store and collectors, 7d. to 7½d. per lb. at store door, less usual selling charges.

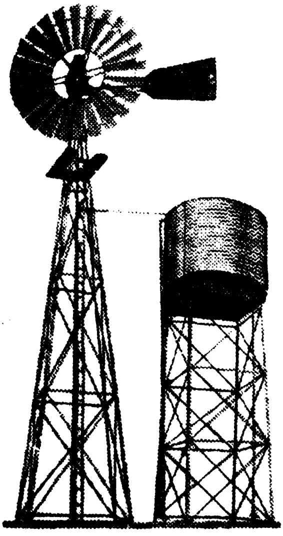
Eggs.—The usual autumnal restricted production is now being experienced with a strong demand because of Lent. Values firmed during the last week or two. Ordinary country eggs, hen or duck, 9d. per dozen; selected, tested, and infertile higher.

Cheese.—The South-Eastern factories although still producing greater quantities just now than for the corresponding period of last year, are now recording declining supplies, but with export overseas having ceased, there is ample cheese for local and Western Australian requirements. Values are steady. New makes, large to loaf, 6½d. to 7d.; semi-matured and matured, 9d. to 11d. per lb.

Bacon.—The supplies of bacon have continued heavy, but the consumption all round has shown steady improvement, largely because of the moderate prices ruling. Values, therefore, are steady for the time being. Best local sides, 7½d. to 7¾d.; best factory cured middles, 6¾d.; large, 6½d.; rolls, 6¼d.; hams, 11d. to 11½d. per lb.; cooked, 1s.; lard, prints, 4s. 6d. per dozen lbs.

Almonds.—The new crop supplies so far to hand were of good quality and met with ready sale from week to week. So far there is not much trade being done in export, but this no doubt will increase during next month. Brandis and softshells, 7½d. to 8½d.; hardshells, 4½d. per lb.; kernels, 1s. 10d. to 1s. 11d. per lb.

Do Not Let Prices Mislead You



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98-99-100, NORTH TERRACE, ADELAIDE.

HONEY.—The new season's honey is giving general satisfaction as the body and colour are satisfactory. Supplies are still fairly heavy, but parcels of choicest suitable for export are wanted. Prime clear extracted, in liquid condition, 2¾d. to 3¼d.; lower grades, 1½d. to 2d. per lb.

BEESWAX.—In limited supply and meeting with ready quittance. 1s. 0½d. to 1s. 1d. per lb., according to sample.

LIVE POULTRY.—Increasing supplies of poultry were marketed during the month under review, and with the approach of Easter, the catalogues submitted were extensive, but keen competition was experienced. We advise consigning. Crates loaned on application. Prime roosters, 4s. 3d. to 5s.; nice conditioned cockerels, 3s. 1d. to 4s. 1d.; fair conditioned cockerels, 1s. 10d. to 2s. 9d.; chickens lower; heavy-weight hens, 2s. 4d. to 3s. 3d.; medium hens, 1s. 8d. to 2s. 1d.; light hens, 1s. 2d. to 1s. 6d.; couple of pens of weedy sorts lower; geese 3s. to 4s.; goslings lower; prime young Muscovy drakes, 3s. 3d. to 4s. 6d.; young Muscovy ducks, 1s. 10d. to 2s. 6d.; ordinary ducks, 1s. 3d. to 2s.; ducklings lower; turkeys, good to prime condition, 11d. to 1s. 3d. per lb. live weight; turkeys, fair condition, 8½d. to 10½d. per lb. live weight; turkeys, fattening sorts lower; pigeons, 3d. to 4d. each.

POTATOES.—Local new, 4s. 6d. per cwt.

ONIONS.—New season's, 4s. 6d. per cwt.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., FEBRUARY, 1933.

IMPORTS.

Interstate.

Apples (bushels)	18	Carrots (bags)	45
Bananas (bushels)	6,122	Potatoes (bags)	83
Citrus—		Bulbs (packages)	59
Lemons (bushels)	6	Plants (packages)	19
Oranges (bushels)	7	Seeds (packages)	39
Passion Fruit (bushels)	130	Wine casks (No.)	2,026
Pears (bushel)	1		
Pineapples (bushels)	656	*Fumigated*—	
Plums (bushel)	1	Wine casks (No.)	13
Tomatoes (bushels)	24		
Nuts—		*Rejected*—	
Peanuts (bags)	35	Bananas (bushels)	51¾
Peanuts, kernels (bags)	29	Secondhand bags (No.)	5

OVERSEAS.

(State Law.)

Wine casks (No.)	338

Federal Quarantine Act.

	Packages.	lbs.		Packages.	lbs.
Seeds, &c.	4,987	895,485	Tea chests	1,552	—
Canes	121	—	Timber	152,939	4,622,577 sup. ft.
Cocoanut chests	330	—			

EXPORTS.

Federal Commerce Act.

		Packages.			Packages.
England	Apples	845	Netherlands, East Indies	Potatoes	10
	Pears	1,470		Other vegetables	3
India	Apples	811	Singapore	Apples	1,053
	Plums	7		Pears	45
Netherlands, East Indies	Apples	240		Plums	54
	Pears	68		Peaches	76
	Peaches	85		Lemons	8
	Plums	62		Grapes	4
	Grapes	11		Vegetables	56

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of March, 1933, the average precipitation for the month of March, and the average annual rainfall.

Station.	For Mar. 1933.	Av'ge for Mar.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.			
Oodnadatta	0·36	0·43	4·70
Marree	0·42	0·52	5·89
Farina	0·74	0·66	6·47
Copley	0·55	0·71	7·94
Beltana	0·26	0·72	8·54
Blinman	0·21	0·80	11·95
Hookina	0·30	0·71	11·53
Hawker	0·38	0·61	12·30
Wilson	0·44	0·59	11·78
Gordon	0·31	0·76	10·63
Quorn	0·40	0·61	13·29
Port Augusta	0·97	0·71	9·42
Bruce	0·60	0·71	9·93
Hammond	0·46	0·68	11·31
Wilmington	0·68	0·79	17·43
Willowie	0·85	0·70	12·19
Melrose	0·79	1·05	22·85
Booleroo Centre	0·57	0·63	15·15
Port Germein	0·94	0·72	12·43
Wirrabara	0·49	0·92	19·21
Appila	0·53	0·85	14·57
Cradock	0·34	0·58	10·83
Carrieton	0·12	0·59	12·31
Johnburg	0·13	0·56	10·61
Eurelia	0·13	0·60	12·87
Orroroo	0·29	0·64	13·21
Nackara	0·20	0·86	11·16
Black Rock	0·24	0·68	12·41
Oodlawirra	0·29	0·76	11·56
Peterborough	0·30	0·72	13·21
Yongala	0·33	0·66	14·42
NORTH-EAST.			
Yunta	0·32	0·59	8·50
Waukaringa	0·20	0·60	8·00
Mannahill	0·11	0·55	8·28
Cockburn	0·38	0·50	7·96
Broken Hill	0·43	0·65	9·63
LOWER NORTH.			
Port Pirie	0·77	0·79	13·17
Port Broughton	0·80	0·60	13·93
Bute	0·84	0·66	15·36
Laura	0·62	0·82	17·91
Caltowie	0·69	0·80	16·69
Jamestown	0·58	0·83	17·71
Gladstone	0·66	0·72	16·29
Crystal Brook	0·90	0·68	15·78
Georgetown	0·60	0·81	18·35
Narridy	0·95	0·79	15·85
Redhill	0·94	0·72	16·55
Spalding	0·77	0·77	18·99
Gulnare	0·76	0·68	18·56
Yacka	0·86	0·64	15·33
Koolunga	1·20	0·65	15·40
Snowtown	1·02	0·71	15·64

Station.	For Mar. 1938.	Av'ge for Mar.	Av'ge Annual Rainfall.
LOWER NORTH.—continued.			
Brinkworth	1·44	0·74	15·74
Blyth	1·48	0·72	16·77
Clare	0·87	1·02	24·53
Mintaro	0·86	0·90	23·42
Watervale	1·25	1·11	26·91
Auburn	1·14	1·09	23·98
Hoyleton	1·20	0·78	17·32
Balaklava	1·18	0·71	15·49
Pt. Wakefield	0·94	0·92	12·93
Terowie	0·26	0·63	13·35
Yarcowie	0·29	0·77	13·57
Hallett	0·44	0·65	16·40
Mount Bryan	0·48	0·69	16·65
Kooringa	0·56	0·87	17·89
Farrell's Flat	0·82	0·75	18·65
WEST OF MURRAY RANGE.			
Manoora	0·87	0·81	18·83
Saddleworth	1·00	0·93	19·55
Marrabel	0·91	0·84	19·84
Riverton	1·40	0·99	20·75
Tarlee	1·12	0·79	18·11
Stockport	1·10	0·78	16·88
Hamley Bridge	0·95	0·76	16·54
Kapunda	0·76	0·99	19·79
Freeling	0·76	0·88	17·85
Greenock	0·70	0·95	21·56
Truro	0·64	0·94	19·96
Stockwell	0·57	0·88	20·12
Nuriootpa	0·75	0·92	20·64
Angaston	0·60	0·99	22·43
Tanunda	0·59	1·03	22·02
Lyndoch	0·72	0·85	23·45
Williamstown	0·85	0·97	27·71
ADELAIDE PLAINS			
Owen	1·31	0·41	14·33
Mallala	0·90	0·75	16·56
Roseworthy	0·81	0·80	17·34
Gawler	0·73	0·91	18·96
Two Wells	1·03	0·77	15·70
Virginia	0·77	0·85	17·12
Smithfield	0·88	0·89	17·50
Salisbury	0·96	0·94	18·54
Adelaide	1·33	1·01	21·10
Glen Osmond	1·41	1·01	25·96
Magill	1·36	1·14	25·50
MOUNT LOFTY RANGES.			
Teatree Gully	1·20	1·23	27·30
Stirling West	1·78	1·79	46·91
Uraidla	1·53	1·79	43·91
Clarendon	1·54	1·49	32·82
Morphett Vale	1·16	1·12	22·64
Noarlunga	1·01	1·02	20·34
Willunga	1·02	1·22	26·01
Aldinga	1·10	1·06	20·21

RAINFALL—*continued.*

Station.	For Mar. 1933.	Av'ge for Mar.	Av'ge Annual Rain-fall.
Mount Lofty Ranges—*contd.*			
Myponga	1·02	0·91	29·48
Normanville	0·76	0·95	20·69
Yankalilla	0·62	1·21	22·85
Mount Pleasant	0·77	1·11	27·18
Birdwood	0·61	1·07	29·15
Gumeracha	0·88	1·29	33·39
Millbrook Res.	0·80	0·92	34·86
Tweedvale	0·93	1·25	35·89
Woodside	1·03	1·18	32·25
Ambleside	1·02	1·35	34·87
Nairne	1·11	1·28	28·09
Mount Barker	1·28	1·36	31·79
Echunga	1·76	1·44	33·15
Macclesfield	1·27	1·40	30·43
Meadows	1·36	1·67	36·12
Strathalbyn	0·92	1·04	19·34
Murray Flats and Valley.			
Meningie	0·68	0·90	18·37
Milang	0·59	0·79	14·92
Langhorne's Ck.	1·16	0·90	14·76
Wellington	0·61	0·87	14·56
Tailem Bend	0·72	1·00	14·70
Murray Bridge	0·80	0·91	13·59
Callington	0·88	0·84	15·20
Mannum	0·67	0·85	11·47
Palmer	0·63	0·89	15·43
Sedan	0·67	0·70	12·11
Swan Reach	1·02	0·76	10·60
Blanchetown	0·84	0·81	11·04
Eudunda	0·64	0·81	17·11
Sutherlands	0·41	0·65	10·82
Morgan	0·65	0·54	9·20
Waikerie	0·47	0·53	9·66
Overland Crnr.	0·61	0·81	10·41
Loxton	0·41	0·83	11·59
Renmark	0·33	0·69	10·49
West of Spencer's Gulf.			
Eucla	0·22	0·86	9·98
Nullarbor	1·40	0·70	8·73
Fowler's Bay	0·92	0·52	11·82
Penong	0·90	0·54	12·12
Koonibba	0·70	0·58	11·82
Denial Bay	0·36	0·62	11·36
Ceduna	0·52	0·51	9·95
Smoky Bay	0·43	0·37	10·28
Wirrulla	0·50	0·42	10·08
Streaky Bay	0·44	0·55	14·82
Chandada	0·62	—	—
Minnipa	0·46	0·53	13·68
Kyancutta	0·37	—	—
Talia	0·51	0·49	14·63
Port Elliston	0·93	0·52	16·39
Yeelanna	0·38	0·55	15·72
Cummins	0·42	0·33	17·35
Port Lincoln	0·19	0·82	19·34
Tumby	0·21	0·66	13·92
Ungarra	0·37	0·73	16·73
Carrow	0·33	0·64	13·08
Arno Bay	0·59	0·75	12·44
West of Spencer's Gulf—*contd.*			
Rudall	0·71	0·43	12·19
Cleve	0·67	0·78	14·66
Cowell	0·70	0·82	11·10
Miltalie	0·70	0·99	13·54
Darke's Peak	0·50	0·49	14·92
Kimba	0·67	0·51	11·52
Yorke Peninsula.			
Wallaroo	0·94	0·80	13·91
Kadina	0·71	0·87	15·61
Moonta	0·62	0·86	15·05
Paskeville	0·73	0·75	15·46
Maitland	0·46	0·87	19·90
Ardrossan	0·65	0·75	13·93
Port Victoria	0·57	0·67	15·40
Curramulka	0·35	0·90	17·87
Minlaton	0·28	0·84	17·80
Port Vincent	0·30	0·66	14·40
Brentwood	0·31	0·75	15·45
Stansbury	0·12	0·79	16·81
Warooka	0·22	0·67	17·51
Yorketown	0·14	0·75	16·94
Edithburgh	0·21	0·83	16·34
South and South-East.			
Cape Borda	0·46	0·87	24·83
Kingscote	0·26	0·80	19·11
Penneshaw	0·15	0·71	18·85
Victor Harbor	0·62	1·00	21·27
Port Elliot	0·46	1·00	19·91
Goolwa	0·50	0·96	17·81
Copeville	0·87	0·69	11·44
Meribah	0·36	0·49	11·10
Alawoona	0·48	0·33	10·02
Mindarie	0·80	0·43	11·91
Sandalwood	0·64	0·62	13·57
Karoonda	0·67	0·64	14·33
Pinnaroo	0·44	0·93	14·54
Parilla	0·51	0·65	13·90
Lameroo	0·81	0·79	16·08
Parrakie	0·59	0·77	14·49
Geranium	0·69	0·87	16·41
Peake	0·85	1·00	16·03
Cooke's Plains	0·38	0·96	15·38
Coomandook	0·60	0·96	17·11
Coonalpyn	0·68	0·88	17·42
Tintinara	0·69	0·90	18·60
Keith	0·55	0·75	17·87
Bordertown	0·50	0·81	19·22
Wolseley	0·51	0·74	18·41
Frances	0·78	0·88	19·99
Naracoorte	0·90	1·00	22·59
Penola	0·73	1·21	26·06
Lucindale	0·91	0·97	23·16
Kingston	0·96	0·99	24·33
Robe	0·92	1·02	24·64
Beachport	0·98	1·16	26·93
Millicent	1·22	1·30	29·76
Kalangadoo	1·23	0·95	32·03
Mount Gambier	1·27	1·40	30·52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		April.	May.
Adelaide	1117	—	—
Alawoona	*	—	—
Aldinga	*	—	—
Allandale East	†	7	5
Alma	*	—	—
Amyton	*	—	—
Angaston	*	—	—
Appila	*	—	—
Appila Yarrowie	†	—	—
Arthurton	*	—	—
Ashbourne	*	5	3
Auburn Women's	*	28	26
Balaklava	*	24	22
Balhannah	*	—	—
Balumbah	*	—	—
Balumbah Women's	*	5	3
Barmera	*	—	—
Beetaloo Valley	1106	10	4
Belalie Women's	†	11	9
Belvidere	†	—	—
Berri	*	10	10
Big Swamp	*	—	—
Blackheath	†	13	11
Black Rock	*	—	—
Black Springs	1108	—	—
Blackwood	*	R	8
Block E	*	—	—
Blyth	*	28	26
Booleroo Centre	*	7	5
Boolgun	*	—	—
Boor's Plains	1113	6	4
Borrika	*	—	—
Bowhill	*	10	8
Brentwood	1114	6	4
Brinkley	†	8	10
Brinkworth	†	10	8
Brownlow	†	—	—
Buchanan	†	—	—
Bugle	*	14	9
Bundaleer Springs	*	—	—
Bute	*	20	18
Butler	*	—	—
Calca	*	—	—
Cadell	*	—	—
Caliph	*	4	2
Caltowie	*	—	—
Canowie Belt	*	—	—
Caralue	*	5	3
Carrow	*	5	10
Chandada	*	—	—
Charra	*	—	—
Cherry Gardens	†	8	6
Clanfield	*	—	—
Clare Women's	1085	—	—
Clarendon	*	10	8
Cleve	*	1	6
Cobdogla	*	—	—
Collie	*	5	3
Colton	*	—	—
Coomandook	*	27	26
Coonalpyn	*	—	—
Coonawarra	*	13	11
Coonawarra Women's	1086	19	17
Coorabie	*	—	—
Copeville	*	—	—
Coulta	*	—	—
Cradock	*	—	—
Cummins	*	14	12
Cungena	*	6	4
Currency Creek	†	10	8
Cygnet River	*	—	—
Darke's Peak	*	—	—
Dudley	*	—	—
Edillilie	*	—	—
Elbow Hill	†	6	4
Eudunda	*	3	1
Eurelia	*	8	13
Eurelia Women's	*	5	8
Everard East	*	—	—
Farrell's Flat	*	28	26
Finniss	*	—	—
Frances	1105	5	3
Frayville	1120	—	—
Gawler River	*	—	—
Georgetown	*	6	6
Geranium	*	29	27
Gladstone	*	7	5
Gladstone Women's	1091	14	12
Glencoe	*	11	9
Glossop	*	—	—
Goode	1115	12	10
Goode Women's	*	12	10
Greenock	1108	17	15
Green Patch	1115	6	4
Gulnare	*	—	—
Gumeracha	*	10	8
Hallidon	*	—	—
Hanson	*	11	9
Hartley	*	5	10
Hawker	*	—	—
Hindmarsh Island	*	—	—
Hookina	*	—	—
Hope Forest	†	3	1
Hoyleton	*	24	15
Inman Valley	1121	20	18
Ironbank	*	—	—
Jamestown	†	19	17
Jervois	*	19	11
Kalangadoo Women's	*	8	13
Kalangadoo	*	8	13
Kalyan	*	10	17
Kangarilla	*	—	—
Kangarilla Women's	†	20	18
Kanmantoo	*	—	—
Kanni	†	—	—
Kapinnie	†	—	—
Kapunda	*	14	12
Karcultaby	*	—	—
Karoonda	*	22	10
Keith	*	6	4
Kelly	*	8	6
Ki Ki	*	—	—
Kilkerran	1115	11	9
Kongorong	*	10	8
Koolunga	†	—	—
Koonibba	*	6	4
Koonunga	*	—	—
Koppio	*	4	9
Kringin	*	10	8
Kulkawirra	*	11	9
Kyancutta	†	4	2
Kybybolite	*	6	4
Kybybolite Women's	*	4	9
Lameroo	*	8	6
Langhorne's Creek	†	5	3
Laura	*	8	13
Laura Bay	1116	11	9
Lenswood & Forest Range	*	—	—
Light's Pass	†	—	—
Lipson	*	8	6
Lone Gum and Monash	*	5	10
Lone Pine	*	10	8
Longwood	*	—	—
Lowbank	*	5	10
Loxton	*	14	12
Lucindale	*	—	—
Lyndoch	†	4	9
McLaren Flat	†	—	—
McLaren Flat Women's	1086	6	4
Macclesfield	†	20	18
MacGillivray	*	4	9
Mallala	*	17	15
Maltee	†	6	4
Mangalo	*	—	—
Mangalo Women's	†	—	—
Mannanarie	*	—	—
Marama	†	—	—
Meadows	*	5	3

INDEX TO BUREAU REPORTS—*continued.*

Branch.	Report on Page.	Dates of Meetings.		Branch.	Report on Page.	Dates of Meetings.	
		April.	May.			April.	May.
Meribah	*	10	8	Roseworthy	†	—	—
Milang	*	8	6	Rosy Pine	*	—	—
Millendilla	*	—	—	Rudall	*	4	9
Millicent	*	28	26	Saddleworth	*	7	12
Millicent Women's	1087	—	—	Saddleworth Women's	†	4	2
Miltalie	†	8	6	Salisbury	*	—	—
Mindarie	*	7	5	Salt Creek	*	—	—
Minnipa	*	—	—	Sandalwood	*	—	—
Modbury	*	—	—	Scott's Bottom	*	8	6
Monarto South	†	—	—	Shoal Bay	†	4	9
Moonta	*	—	—	Smoky Bay	*	—	—
Moorlands	†	12	—	Snowtown	†	14	12
Moorook	*	—	—	South Kilkerran	*	4	9
Morchard	†	7	5	Spalding	*	—	—
Morphett Vale	*	—	—	Springton	*	5	3
Mount Barker	1122	17	15	Stanley Flat	*	17	15
Mount Bryan	*	—	—	Stirling	*	—	—
Mount Compass	1122	6	4	Stockport	1111	—	—
Mount Gambier	†	14	12	Strathalbyn	*	12	10
Mount Hope	†	4	9	Streaky Bay	*	28	26
Mount Pleasant	†	—	—	Tailem Bend	*	13	11
Mount Remarkable	*	—	—	Talia	*	28	26
Mount Schank	*	—	—	Tantanoola	†	1	6
Mudamuckla	*	8	13	Tantanoola Women's	1088	5	3
Mundalla	†	—	—	Taplan	*	4	9
Mundalla Women's	†	18	11	Taragoro	†	6	4
Murray Bridge	*	—	—	Tarcowie	*	—	—
Murraytown	1106	—	—	Tarlee	*	R	R
Mypolonga	*	—	—	Tarpeena	*	—	—
Myponga	†	20	18	Tatiara	*	—	—
Myrla	*	5	10	Thrington	*	—	—
Nantawarra	†	6	4	Tintinara	*	—	—
Naracoorte	*	8	13	Truro	†	17	15
Narridy	*	—	—	Tulkineara	*	13	11
Narrung	*	—	—	Tweedvale	†	20	18
Nelshaby	1106	—	—	Two Wells	*	—	—
Nelshaby Women's	*	—	—	Ungarra	*	13	11
Netherton	†	5	10	Upper Wakefield	1112	—	—
New Residence	*	—	—	Uraidla and Summertown	*	8	1
North Booborowie	*	—	—	Veitch	*	—	—
Nunjikompita	*	6	4	Virginia	*	—	—
Nunkeri	*	5	3	Waddikee Rocks	*	8	8
O'Loughlin	*	10	8	Waikerie	*	14	12
Orroroo	*	—	—	Wallala	*	12	10
Overland Corner	1117	5	10	Wanbi	*	26	24
Owen	1110	7	5	Wandearah	*	4	9
Palabie	*	—	—	Warcowie	†	4	9
Parilla	*	4	2 & 30	Warcowie Women's	*	4	9
Parilla Women's	†	19	17	Warramboo	*	4	9
Parilla Well	*	10	8	Warramboo Women's	1090	—	—
Parilla Well Women's	*	25	20	Wasleys	1112	13	11
Parrakie	*	—	—	Wasleys Women's	†	6	4
Parrakie Women's	1087	25	30	Watervale	*	17	15
Paruna	*	7	5	Wauraltee	*	4	9
Paskeville	†	4	9	Weavers	†	10	8
Pata	*	7	5	Wepowie	*	10	8
Penneshaw	*	—	—	Whyte-Yarcowie	*	—	—
Penola	*	1	6	White's River	*	—	—
Penola Women's	1098	—	—	Wilkawatt Women's	*	—	—
Penwortham	*	6	4	Williamstown Women's	†	5	3
Petersville	*	4	9	Williamstown	*	—	—
Petina	*	22	27	Willowie	*	24	22
Pinbong	*	—	—	Wilmington	†	11	15
Pinkawillinie	*	—	—	Windsor	*	—	—
Pinnaroo	*	—	—	Wirrabara	1107	—	—
Pinnaroo Women's	1087	7	5	Wirrilla	*	6	6
Port Elliott	*	15	20	Wirrilla Women's	1090	6	4
Pygery	1116	4	9	Wirrulla	*	19	17
Pygery Women's	*	—	—	Wolseley	†	10	8
Quorn	*	—	—	Wudinna	*	—	—
Ramco	*	10	8	Wynarka	*	—	—
Rapid Bay	*	—	—	Yacka	*	—	—
Redhill	†	—	—	Yadnarie	*	4	9
Rendelsham	*	6	6	Yallunda Flat	*	—	—
Rendelsham Women's	1088	—	—	Yandiah	*	14	12
Renmark	*	—	—	Yaninee	*	—	—
Rhynie	*	—	—	Yantanabie	*	—	—
Richman's Creek	*	—	—	Yeelanna	*	5	10
Riverton	*	10	8	Yorketown	*	—	—
Riverton Women's	*	—	—	Younghusband	*	—	—
Roberts and Verran	*	—	—	Yurgo	†	—	—
Rosedale	†	—	—	Yurgo Women's	*	—	—

* No report received during the month of March. † Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[Branch Secretaries are reminded that the following are exempt from payment of the Annual Bureau subscription:—Life members, Branch Secretaries, members appointed before August 1st, 1930, and new members who reside in the same house as (a) a life member, (b) Secretary, or (c) another member who already subscribes.

The subscription for all other members is 2s. 6d., commencing from August 1st in each year, provided that—subject to the above exemptions—nominations forwarded during the months of January to June must be accompanied by a payment of 1s. 6d. each nomination for that period.]

WOMEN'S BRANCHES.

CLARE (Average annual rainfall, 24.53in.).

March 4th.

PICKLES AND SAUCES.—Paper contributed by Misses E. Richardson and E. Sexton. Practically every woman who is responsible for a household has a well-stocked cupboard of pickles and sauces. Such a cupboard is doubly essential to the woman on the land. The man on the land usually kills his own meat, and when a whole sheep, or even half a one, has to be dealt with, it means a considerable amount of cold and corned meat for the family—and this is when the real value of well flavored pickles and piquant sauces is known, often making the difference between a dull and uninteresting meal and an appetising and enjoyable one. Even if one has to buy the vegetables, home-made pickles are generally cheaper and much nicer than bought ones, but most homes nowadays have at least a small vegetable plot, which, if well looked after, will supply the greater part of the vegetables required for pickling. There are a great many different kinds of pickles and sauces, and extravagant recipes which call for countless ingredients, and take hours in the making. These are decidedly unpopular, and rightly so, with busy women. Pickles may be roughly said to consist of two kinds—vinegar pickles and mustard pickles. In the former the vinegar, though spiced, is comparatively clear, while the latter is colored and thickened by mustard, tumeric, and either flour or cornflour. I always use cornflour, it is finer and gives better results. Vegetables for pickling are nicer if picked on the young side. Always use the best vinegar. Second grade vinegar makes inferior pickles. Almost any vegetables, and a great many fruits, make good pickles, but for mustard pickle a mixture of green tomatoes, cucumbers, onions, and french beans is favored. The following is a particularly good recipe:—1doz. small cucumbers, 3lbs. green tomatoes, 1½lbs. french beans, 1½lbs. onions, ½ cup cornflour, ½ cup sugar, 1½ tablespoons mustard, 1 dessertspoon tumeric, ½ teaspoon mixed spice, ½ teaspoon curry powder, 2½ pints vinegar, ½ teaspoon cayenne. Cut up vegetables and make a brine of 2 quarts of water and ½ pint of salt. Pour over vegetables and stand 24 hours. Heat just enough to scald. Drain through colander. Mix all ingredients with cold vinegar to make a smooth paste, add enough vinegar to make 2½ pints in all. Boil until it thickens, keeping free from lumps. Add vegetables, and heat well through. Bottle when cold. This same mixture makes excellent cauliflower piccalilli. Break the cauliflower into small pieces, sprinkle with salt, and stand all right. In the morning drain and put in the thickened mixture. Boil half an hour. *Pickled Onions.*—Use small, hard pickling onions. Pour boiling water over them and remove the skins quickly, sprinkle with salt, and leave until next day. Fill glass jars with onions and cover with cold vinegar, to every quart of which has been added 2 teaspoons whole spice, 2 teaspoons whole black pepper, a few cloves and chillies. Take care that each jar has its share of spices. Always use parowax for sealing all pickles and sauces. *Green Tomato Pickle.*—Take 6lbs. green tomatoes, 2 large onions, 1 cup of treacle, 2ozs. whole ginger (bruised), ¼oz. cloves, ½ teaspoon cayenne pepper, 1½ bottles brown vinegar. Cut tomatoes and onions in slices and cover with brine (1 cup of salt to 2 quarts of water). Stand all night. In the morning pour off all liquor, put vegetables in preserving pan with other ingredients and boil 20 minutes. *Pickled grapes.*—1 quart of vinegar, 1lb. sugar, 1 eggcup full of cloves, and peppercorns. Boil vinegar, spices, and sugar together for a few minutes. Wash and cut grapes, leaving a small piece of stalk on each to prevent breaking. Add as many grapes as vinegar will cover. Romove from stove. Bottle and seal when cool. Large black grapes or ladies fingers are best. *Tomato Sauce.*—12lbs. tomatoes, 1lb. each of apples, onions, and sugar, ¼lb. salt, 1oz. each of garlic and allspice, ¼oz. each of chillies, mace, and cloves, ½oz. of curry powder, 1 quart of vinegar. Wipe and break tomatoes. Slice and peel apples and onions. Cut garlic fine. Boil all together for three hours. Strain through colander. Bottle when cool. *Tomato Sauce without Vinegar.*—20lbs. tomatoes, 2lbs. sugar, ¼lb. salt, 2ozs. garlic, 2ozs. allspice, 1oz. cloves, 1 teaspoon cayenne pepper, 2½ozs. acetic acid. Boil all ingredients, except sugar and acid, together for one hour. Strain through colander, add sugar, and boil one hour. When cold, add acetic acid, stir well, and bottle. The liquid form of acid is best, and can be obtained from chemist for about 6d. *Plum Sauce.*—6lbs. plums, 3lbs. sugar, 3 pints vinegar, 1 teaspoon salt, 1 teaspoon cayenne pepper, ½oz. cloves, ½oz. allspice, 2ozs. whole ginger (bruised). Boil all togeher until stones separate. Strain through colander and bottle. *Betty's Sauce*—3 cups of vinegar, 1 cup of dark plum jam, 1 cup of treacle, ½oz. bruised ginger, ½oz. allspice, ½oz. chillies, ½oz. cayenne pepper, ½oz. cloves, 1oz. salt. Boil all together for 2½ hours. Strain through colander and bottle. *Worcestershire Sauce.*—1oz. black pepper, ½oz. cayenne pepper, ½oz. each cloves, mace, shallots, and garlic, 2ozs. seedless raisins, 1 tablespoon salt, 1lb. brown sugar, 2 quarts vinegar. Boil 20 minutes, and when cool add ½ pint of Indian Soy, or 1 cup of dark plum jam as a substitute. Bottle and seal. (Secretary Mrs. Rogers.)

COONAWARRA.

December 14th.—Present: 24 members.

Mrs. W. L. Redman (President) gave a demonstration of cake decoration. Eight members brought cakes, icers, and ingredients to learn to ice Christmas cakes. *To ice Cake.*—First Coat—Beat together 1 dessertspoon melted butter and the yolk of 1 egg, add 2 tablespoons warm water, stir in ½lb. icing sugar and a little lemon juice, flavor with ratafia, and lastly stir in half cup cocoanut. Slice the rounded top off cake. Ice this, and turn upside down on a piece of cardboard about 1in. larger than cake. Then ice the rest of the cake. Leave overnight to dry. Second coat—Mix enough sifted icing sugar with the unbeaten white of an egg until it is of a consistency to spread. Spread second coat, dip knife in hot water to smooth. Leave a couple of hours to set. *Icing for Decoration.*—Break white of egg in basin, stir a little. Add ½lb. sifted No. 1 icing sugar, half teaspoon lemon juice, then 2 drops of blue essence (made by mixing quarter of a knob of blue with 1 dessertspoon water, put in bottle, and keep for future use). Add half teaspoon glycerine and beat well. Finally, decorate the cake. (Secretary, Mrs. F. Skinner.)

McLAREN FLAT.

March 2nd.—Present: 20 members.

GARDENING.—Reading a paper on this subject, Mrs. J. Foggo said the soil for the garden should be friable, so that the small roots of the seedlings could develop quickly. To prepare the land it should be dug deeply and then dressed with manure. Heavy soils should receive an application of lime. Most seeds gave best results when sown in boxes, the soil of which should be prepared beforehand by the addition of well-rotted manure, or a little bone dust. The soil should be firmed by watering, the seed sown thinly, and then covered with very fine earth and a light mulch of stable manure, which must be kept moist. After sowing the box should be covered with glass, with a sheet of brown paper on top, until the seeds germinated. If the seeds are raised at home a cool day can be selected for transplanting. See that each seedling is watered as it is set out, so that the earth will settle around the roots. To prolong the flowering season, remove all dead flowers from the plants. Roses should be cut with a long stem, the cut being made to an outgrowing bud, which will soon shoot and produce another flower.

On March 4th the Branch held a very successful dahlia and flower show. Mr. C. Robertson opened the show, and many beautiful flowers were staged. It was decided to make this an annual and much larger fixture. The prize winners were Mr. B. Reeves, Mesdames J. Foggo, W. C. Cooper, W. Oakley, Misses F. Bell and R. Elliott. Mr. R. Elliott was judge. Musical items and dancing were enjoyed during the evening. (Secretary, Mrs. Robertson.)

MILLICENT (Average annual rainfall, 29.76in.).

February 17th.—Present: 12 members.

Recipes for Pickles.—Mrs. L. Oberlander gave the following:—*Pickled Cucumbers.* —In an earthenware vessel place layers of vine leaves and cucumbers alternately. Fill vessel with cold water, adding a quantity of strong brine and salt, also a number of small chilies. Make vessel airtight. Ready for use in three weeks. *Pickled Gherkins.*—Boil vinegar and peppercorns together and allow to go cold. Put gherkins in a jar with a few vine tendrils and leaves, and add a sprinkling of dill. Pour on enough white vinegar to cover gherkins. *Mustard Pickles.*—Half gallon each of cucumbers, green tomatoes, onions, and cauliflowers. Make a brine of 1 pint salt to 1gall. water, pour over vegetables. Soak 24 hours. Mix 2 cups flour, ½lb. mustard, 1 heaped tablespoon tumeric, 1 cup sugar, with cold vinegar to a smooth paste. Add 1gall. of vinegar, put in pan and stir well. When thickened, add vegetables and cook.

Damson Sauce (Mrs. A. Bryant).—6lbs. sugar, 3 pints vinegar, 1 teaspoonful cayenne pepper, 1 handful of salt, ½oz. allspice, ½oz. cloves, 1 handful of whole ginger (bruised). Boil all together for 1 hour and then strain through a colander and bottle. (Secretary, Mrs. H. Hutchesson.)

PARRAKIE (Average annual rainfall, 14.49in.).

February 24th.—Present: 13 members.

Home Dressmaking.—Mrs. N. Catford read the following paper:—"When attempting to cut out a garment the first thing to do is to determine the right side of the material. Linen and plain silk should be held up to the light, and the right side is the one with a smooth finish; in velvets the dark side must face upward. The success of dressmaking depends on procuring a good pattern. Place the pattern to the figure and make the necessary adjustments, then place all the pattern on the material. Never be in a hurry when cutting out, for if one takes the trouble to place the pattern to the best advantage material will be saved, it is annoying to have a frock partly cut out and find there is a shortage of material. When placing the garment together, keep a tin of pins handy, it will save much tacking. When machining keep the machine well oiled, and see the needle is sharp—a slightly blunt point is apt to pull threads in the cloth, especially in silks and in figured material, this will interfere with the pattern. When the garment is finished, press the seams thoroughly—neglect to do this will often spoil the effect of a well-made garment." (Secretary, Miss J. Halliday.)

PINNAROO (Average annual rainfall, 14.54in.).

March 3rd.—Present: 16 Members.

Home Remedies.—Mrs. E. Grey read the following paper and exhibited a sample made according to each of the recipes:—"*Marshmallow Ointment.*—½lb. lard, 1 piece each of tobacco, beeswax, and resin the size of a large walnut, 1 large handful of green marshmallow leaves. Put all in a saucepan or jar and simmer on edge of stove for several hours. Stir with a stick several times until all ingredients have melted, then strain through a piece of muslin into a clean glass jar, and add 1 dessertspoon of turpentine or eucalyptus. Mix well and cork. *Cough Mixture.*—2 tablespoons whole linseed, 1 cup treacle, ½ stick liquorice. Boil in 1 pint of water until liquorice is dissolved (about ½ hour), when nearly cold add the following:—3d. laudanum, 3d. paregoric, 3d. aniseed, 3d. peppermint. Dose: 1 tablespoon three times a day. *Camphorated Oil.*—Break up 2oz. cake of camphor and dissolve in small bottle of olive oil on side of stove. *Embrocation for Rubbing.*—½ pint turps, ½ pint vinegar, small bottle eucalyptus oil, and 2 eggs. Shake 20 minutes. *Ointment.*—1oz. white beeswax, 3d. eucalyptus oil, 3d. green swallow oil, 3d. vaseline, 3d. lanoline. *Tired Feet.*—For tired and aching feet, a cake of camphor ground and put in a bottle of methylated spirits and rubbed on will afford relief. Soak feet in hot water for ½ hour in which a teaspoon of washing soda has been dissolved. Dry well and rub with olive oil. This should be done every night until the hard skin peels off. *Cracked Hands or Fingers.*—Mix 1 tablespoon of powdered sulphur with olive oil into an ointment. Place some on each crack and bind up firmly. *Sore Eyes.*—Bathe eyes in a weak solution of Epsom salts and water. *Carron Oil.*—For burns and scalds take equal parts of lime water and olive oil and mix well together. *Lime Water.*—Dissolve a lump of unslaked lime (about the size of an egg) in a pint of water, when clear the mixture is ready for use. *Fruit Salts.*—2ozs. each of tartaric acid, Epsom salts, cream of tartar, carb. soda, 1oz. magnesia, and ½lb. lemon flavored icing sugar." (Secretary, Mrs. F. Atze.)

RENDELSHAM.

February 1st.—Present: 10 members.

Mrs. Altschwager, of the Millicent Branch, read a paper on "Jam-making." "If a good color is wanted in any berry jam, the fruit must be boiled rapidly. This not only produces a bright, rich color, but improves the flavor of the jam. Quinces, pears, and apples require gentle cooking for a good flavor. In all berry jams the fruit should not be over-ripe nor fermenting. This applies to all fruits. *Raspberry Jam.*—Boil the fruit without sugar or water, stirring well to prevent burning. Then add pound to pound of sugar, and see that the sugar is well dissolved before the jam boils again. Allow to boil for eight minutes, then pour off into jars to set. Then cover the top with a thin coat of melted paraffin wax and cover with paper. *Loganberry Conserve.*—6lbs. loganberries (not fully ripe), 6lbs. sugar, 2 pints water. Make a syrup by boiling together water and sugar for five minutes, then add the berries and bring to the boil, cook rapidly for 15 or 20 minutes. *Raspberries and loganberries* blend well for jam. Boil 20 minutes without sugar, and after adding sugar and bringing to boiling point, boil again 8 to 10 minutes. Loganberry jam may be made the same as raspberry and loganberry. Have one-third of the berries under-ripe. *Loganberry and Cherry Plum.*—3lbs. firm red berries, 3lbs. cherry plums, 4½lbs. sugar. Put plums on to cook with 1 cup water, and when cooked fairly soft, add loganberries and boil for another 10 minutes. Then add sugar, and after it dissolves and comes to the boiling point, boil fast until a good consistency. *Melon Jam.*—The following flavors are suggested:—To each 6lbs. melon allow 6 lemons the skins very finely shredded and left in jam, or left in large pieces and removed when jam is finished); or 6ozs. green ginger tied in loose muslin bag and removed when jam is finished; 1 medium sized pineapple, finely shredded; or 3 oranges; or 2doz. passion fruit; or 1 teaspoon essence of pineapple or essence of lemon. *Apricot Jam.*—Stone and cut up fruit, to each lb. allow ¾lb. sugar. Stew 7lbs. sugar to 12lbs. of apricots overnight, next day cook in its own juice until quite soft. Then add the rest of sugar and dissolve slowly, when it reaches boiling point, cook and skim until finished—20 or 30 minutes. *Apple Jelly.*—Use green windfalls, cut in quarters, cover with water. Tie a handful of cloves in muslin and boil with it until apple is soft, but not broken. Take out cloves, strain the juice and add cup for cup of sugar to the juice, and put the bag of cloves in too. Cook 20 to 30 minutes, boiling hard, remove cloves and bottle jelly. *Quince Jelly* can be made in a similar manner, always remembering that quinces must be green and juicy, and cut the flower end off from end of quince. At the conclusion of the subject afternoon tea was served. (Secretary, Mrs. G. Andrews.)

TANTANOOLA.

March 1st.—Present: 13 members.

HOUSEHOLD HINTS.—Mrs. Burchard read the following paper:—"The housewife can very profitably spend a few hours occasionally on planning her work on systematic lines and by providing a place for everything necessary for her work in an easily accessible and handy place, she can both minimise her steps and save labor. Badly tarnished copper is quickly cleaned when rubbed with vinegar and salt. Salt added to boiled starch prevents the iron from sticking to the clothes. To prevent mustard from caking and drying in the mustard pot—add a little salt when mixing. To make camphorated oil: grate a 3d. cake of camphor in a half pint of olive oil, cork bottle, and stand in a basin of hot water or in a warm place by the stove until dissolved. Lemon juice and salt will remove rust from cotton or linen articles. When sewing on buttons place the knot on the right side of cloth directly under the button, also fastening of thread. This helps the button remain on longer. One egg well beaten is worth two not beaten. Do not boil stews. A good furniture polish can be made by mixing equal parts of raw linseed oil, turpentine, methylated spirits, and vinegar. Bottle and cork well. Shake before using. After use all brooms and mops should be suspended with handles downwards to prevent bristles, &c., being flattened on the ground. Two large strong nails driven in firmly about 1½in. apart on a board fairly high on the wall make an excellent rack for all house and yard brooms, as well as washing and polishing mops. A dessertspoonful of turpentine added to a bucket of water makes a disinfectant which will dispel most odours. For a dry, throat-tickling cough mix equal parts of glycerine and lemon juice—or honey and lemon juice—and keep it handy by the bedside. Keep a bottle of carron oil on a shelf in the kitchen for the treatment of burns. To make carron oil, use equal parts oil and lime water, shake well together in a bottle. Always use an enamelled pan when frying tomatoes, and springle with a little sugar as well as salt. When using dripping for cakes, add the juice of a lemon. This will improve the flavor and take away the fatty taste that cakes made with dripping sometimes have. Always keep some household ammonia handy; it is invaluable for relieving the smart of an insect sting. Sniffed repeatedly it will relieve a cold in the head. For washing brushes and combs it has no equal. Do not stand brushes in the sun to dry, but in the wind or a draught. *Washing Silk.*—To keep white silk a good color, soak before washing in cold water to which a tablespoon of borax has been added; wash in luke-warm soap suds and put a little methylated spirit in the last rinsing water. Dry out of doors. When adding fresh water to flower vases, use a teapot. When a drawer sticks every time it is opened, rub a little soap on the place where it sticks; also on the window sash if troublesome in sliding. Green vegetables should be boiled quickly with the lid off the saucepan. When the juice has been extracted from lemons do not throw the peels away. Added to the water in which handkerchiefs are boiled it will help to whiten them. Turn the handles of the saucepans in when on the stove. There is less danger of knocking them in passing and so causing accidents. If a door creaks, oil the hinges, using a feather instead of the oilcan to supply the oil. Holes made by screws may be successfully filled with a mixture of sawdust and glue. Make into a thick paste, placed into the hole, and polished or painted when dry. A basin of cold water placed inside the oven when baking a custard or milk pudding will prevent it from curdling. A good change for using up cooked potatoes is by making into fritters. Children are very fond of them. ***Method.***—To about 3 cups of cold mashed potatoes add 3 eggs and seasoning, 1 cup of S.R. flour, and sufficient milk to make a fairly stiff batter. Drop spoonfuls into a pan of hot fat and fry to a golden brown color. Sugar bags can be made into quite useful articles—a laundry apron with a detachable water-proof slip underneath is very protective when rubbing clothes. Old garments or small useless lengths of new materials

1933 CALENDAR 1933

JANUARY

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FEBRUARY

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MARCH

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APRIL

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JULY

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OCTOBER

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NOVEMBER

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DECEMBER

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1934 CALENDAR 1934

JANUARY

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FEBRUARY

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MARCH

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APRIL

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MAY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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● FULL MOON.

if cut into strips and sewn in rows on an opened sugar bag make an absorbent bath mat, which will give long service and stand repeated washings. Small boxes of suitable sizes, either covered or painted, and kept on a shelf in either the dresser or cupboard, is an excellent idea for keeping the kitchen linen in order, providing drawers are not available. Several are required, viz., one for tea towels, another for luncheon cloths, because if there are school lunches or men's dinners, or lunches at any time, a fair number of these small cloths are needed. Then there are pudding cloths, bread and cake towels, and meat bags. A box containing a number of spare strips or pieces of clean white cloth—often urgently required for bandages. Attractive and useful boxes for many different purposes can be covered with cretonne at very small cost. Boxes can be had for the asking at most stores, and starch paste used to work with, as it is clean and leaves no marks. In the girls' bedroom quite a dainty scheme can be achieved by covering hat boxes, lingerie and other small boxes all in the one pattern.'' (Secretary, Mrs. Telfer.)

WARRAMBOO.

March 3rd.—Present: Nine members.

Dressmaking.—Miss L. Hampel read the following paper:—''Dressmaking is by no means an easy task. Nowadays several firms prepare paper patterns which are quite satisfactory, but the best way is to draft a pattern. The garment must fit the figure, and also the person should feel at ease in it. To take measurements for checking commercial patterns, or to draft one, it is necessary to stand in a natural position. To take the measurements, the following instructions should be observed:—Bust: Right around the body, under the arms, and passing over the shoulderblades. Chest: Firmly above the bust line, where the arms join the body. Shoulder: From where the neck joins the shoulder to the top of the arm joint. Waist: Firmly around the body, according to the design. Under arm: Down the side from the armpit to the waist line. Back: Above the bust measurement where the arms join the body. Hip: 7in. below the normal waist line. Length: Where the neck joins the shoulder, over the bust, and down to the ground. The height above ground to hem of frock to be deducted from length measurements. Sleeve: With arm bent from where the shoulder joins the arms to the wrist bone. Wrist: Broadest part of hand. See that all measurements are taken accurately. Test the measurements on the pattern, and alter accordingly. To lengthen a pattern, make a tuck in the material. To shorten a pattern, make a tuck in the pattern. Place the pattern on the material to see if there is sufficient to make the garment. Think out the placing of the pattern, this will save a lot of material. After cutting, proceed with the seams, of which there are several kinds, the most common being French, Run and Fell, or Flat. The flat seams are mostly used on thick material. Sew about a ½in. seam on the wrong side, press out flat with hot iron, protecting garment with a damp cloth, and sew down on the edge of it. Another method of finishing a seam is by pinking it, or nicking small V-shaped pieces out along the edges of the seam to prevent fraying. The neck and hem can sometimes be bound, but the bias binding must be on the true cross to set correctly. Neck and cuffs can be either faced or piped. Hems can be slipstitched or rolled, or, if light material, hemstitched. Buttonholes must be buttonholed stitched or bound. Binding is preferred on a heavy material. Sew all pieces of bodice together, and any other parts of frock, such as gores on skirt, before stitching actual seams. Much depends on neatness, but the main point in dressmaking is to have the cutting done correctly.'' (Secretary, Mrs. A. Collins.)

WIRRILLA.

February 2nd.—Present: Eight members.

Washing and Ironing Collars.—Mrs. A. Evans read the following paper:—''Wash collars in usual way. After boiling be careful to rub out all old starch before blueing and drying. When thoroughly dry, mix about 2 heaped dessertspoons of starch in a small quantity of cold water and then add ½ teaspoon powdered borax dissolved in a little boiling water. Then add enough cold water to make about ½ cup, add while still warm. This quantity will do three or four collars. Dip collars in when dry and see that they get well starched, squeeze out not too dry and lay on clean cloth, and with another clean damp cloth rub over collar, this will remove any lumps of starch. Roll up in cloth and leave for a few hours before ironing. Have a well heated iron and again rub over with a damp cloth before ironing. Stretch the machine stitching to prevent creasing, then iron right side, coming down heavily with the iron to make linen as smooth and glossy as possible. Then iron each side alternately until perfectly dry. Put linen on a hard, smooth surface, and with a damp cloth rub evenly all over. Finally, rub quickly with the back edge of the iron. If blisters occur, prick with a pin to allow air to escape, then damp and iron again.'' (Secretary, Mrs. W. Jones.)

CONFERENCE AT GLADSTONE.

A special session for women was held at the Mid-North Conference at Gladstone on March 15th. Mrs. Smallacombe presided over an attendance of about 80 delegates from the Nelshaby, Belalie, Parilla, Saddleworth, and Gladstone Branches. The following papers were read:—

THE SHADE HOUSE.

[Mrs. J. H. Franks, Nelshaby.]

In the northern climate lovers of the flower garden are confronted with many problems in summer brought about by various causes, very hot spells, shortage of water, ravages of white ants, &c., and whilst beautiful blooms can be grown during winter and spring, it is difficult to carry on during summer. This is the time when one appreciates the green beauty of the shade house, which is at its best in the hot months.

It need not be an expensive one, and can be easily and quickly constructed from inexpensive or waste material; the pine trimmings procurable at Wirrabara Forest, for instance, make an ideal shade house, ornamental and well adapted for its purpose. The sides require to be close so that there are no draughts, which are detrimental to plants. The roof most suitable is of wide-meshed wire netting, threaded with light brush; this being very much better than laths as it gives a more diffused light.

Suitable potting soil is important, ordinary garden soil quickly sours from the retention of moisture. Potting soil needs to be moderately porous so that the moisture percolates easily. Small pots are preferable to large ones, it being better to move a plant on to a larger pot as it grows. This, of course, necessitates regular and frequent watering; complete drying out is injurious, especially to ferns. However, it is equally bad to stand pots in saucers to retain the moisture. Always use rainwater if possible. Weak liquid manure and soot water given occasionally after the usual watering help the growth considerably. Another important point is drainage, pot shards and charcoal being best. Finely broken charcoal in the soil is appreciated by the plants; it keeps the soil sweet and holds moisture in the hot weather. Soil must be of a light nature, having plenty of coarse sand, leaf mould, a small proportion of old manure, and a little garden soil. The decayed leaves found under acacia trees are a valuable addition to potting soil. Do not use lime.

A bush house offers good opportunities for striking cuttings of all kinds of shrubs and plants. Sand will be found the best medium for this purpose, but the plants will need the addition of some richer soil when potted on. Very many kinds of ferns thrive excellently, including the adiantums or maiden hairs. Begonias, cyclamen, fuchsias, primula, aspidistra, and various lillies and coleus are only a few of the plants that will thrive in the shade of the brush. Soot is valuable around the plants, both to kill insects and as a fertiliser, especially to ferns; cold tea benefits maiden hair ferns.

Scale may bother the aspidistras at times, especially in March, but these can be removed by a couple of applications of thin, boiled starch to which has been added a very small piece of soda. Wash the leaves later with clean water and keep the leaves clean.

PASTRY MAKING.

[Mrs. R. Wienert, Gladstone.]

The best puff paste can be made without much trouble. On days when puff paste is to be made mix the first part directly after breakfast.

Place a large cup of plain flour in a bowl with a pinch of salt, make a well in the flour and drop in the yolk of one egg. Squeeze over it the juice of half a lemon, then add three-quarters of a cup of cold water. Stir this all together until flour is well blended, then sprinkle over some more flour and tuck it in at the sides. This can then be put out of the way for two or three hours until ready to roll it for the first time. See that the butter, lard, or margarine is quite firm, otherwise it will mix with the dough and will not rise as required. Roll out the dough on a well-floured board and place on it one-third of the fat. Roll out again and fold the ends into the middle and then in two and roll again. Then fold in thirds and it can be left until ready to spread again. Do this until all butter is used. The last time of rolling leave it from ⅛in. to ½in. thick. This is the right thickness for pastry squares to be served with fruit or jam tarts.

Try the oven with a piece of newspaper; if it curls and browns fairly quickly the heat of the oven will be just right. Glaze the tops of tarts with fresh milk and bake about 10 minutes.

The fruit or meat for pies should be quite hot or boiling. If pastry is placed on cold fruit it has to be cooked too long, then often the top is hard, and the underneath doughy. For pies, the pastry need not be so rich, two cups of flour (plain), half teaspoon of salt, and three-quarters of a cup of cold water, and ½lb. butter. Rub in 2ozs. of butter and leave the rest to roll in as mentioned before. If no lemon is available, sprinkle cream of tartar over each spread of butter. This quantity will make two nice sized pies or one pie and two tarts. Do not roll the dough out much larger than the dish, and only the corners will have to be cut off. These can be placed on top of the pie and moistened with fresh milk. Do the same with tarts, then there is no waste. If the tarts are cooked without jam they keep better, the jam usually going hard if kept.

Sultana roll can be made with half the pastry. Roll out the pastry thinner than for pie, wash some sultanas, and cover half, then dissolve half cup of sugar in quarter cup of milk, and pour over sultanas; sprinkle with cinnamon or mixed spice and fold the other half over and squeeze the edges together like a pastry. Wet well with milk and bake 15 to 20 minutes on the oven slide or in a baking dish.

WORK FOR WINTER EVENINGS.

[Mrs. E. L. Orchard, Belalie.]

Winter is approaching, and with it will come long evenings that will pass all too quickly for the busy mother with small boys and girls to make and mend for. It is not necessary to spend all the evenings mending, and if the work is planned so that something new and interesting shall be done, the mending will be finished with more speed.

Knitting is very popular, as every occupant of the home can wear something that has been hand knitted—pullovers, cardigans, scarves, caps, socks, stockings, singlets, bonnets, and dozens of articles in finest cobweb two-ply wool with large needles, or double wheeling wool on fine needles, in plain or fancy patterns. Besides wearing apparel, articles for the home can be knitted—hot water bag covers, cushion covers, bed spreads, cotton lace for d'oyleys, tray cloths, pillow shams, and numberless other articles.

Crochet is regaining its popularity, and is useful in many cases where a person is unable to knit, and particularly for d'oyleys or edges of tray clothes and finishing necks and sleeves of undies.

Tatting is harder to learn, but, when mastered, the worker can make dainty insets and edgings for infants' clothes, underwear, and napery.

Another fascinating hand work is *netting*. It is not hard to do, and all that is required is a netting needle, a ruler or rod, and thread of a suitable thickness. A small needle, rod, and linen thread will make a d'oyley that will wear for many years, and a large needle, inch wide ruler, and macrame thread will make a hammock, onion bag, tennis net, or other useful article.

Hand embroidery with its multitude of stitches can be used in charming designs on personal wear and household linen. A spray or monogram does not take many evenings to work and is a pleasure to launder and to wear.

Crepe paper can be worked into many pretty and useful articles, and often the making of one thing suggests another where one's artistic abilities can be developed. In the finer stitcheries, there is point lace, Limerick lace, hedebo, and many others, but they are all more or less trying for the eyes and should only be worked by a person with good eyesight and under a strong light.

Rug making.—This is the most fascinating of all winter work. There are several kinds of hooked rugs, knitted with thread as a background and small pieces of material worked in, crocheted lengths of old silk stockings, and the only expense is a large crochet hook. But most satisfactory is the hooked rug worked on canvas or hessian. It can be very economical, because except for the foundation and steel hook (No. 00) there is no other expense, as all old cloth can be used. No matter how worn, any woollen goods can be used, and cotton, too, but wool is better; it keeps its warmth to the last thread, and any article that can be cut into strips—long ones if possible, namely, trousers, coats, frocks, and skirts—will make hooked rugs of almost everlasting wear.

Cotton and silk can be used, but it is not wise to mix the materials as they have different wearing qualities. A design can be drawn on graph paper and the squares counted to correspond with squares on the canvas, or the beginner can commence at the outside edge and work four or five rows in one dull color, then one row in a bright color, then four or five in the first color, and fill in the centre with blocks of a different shade. The stitch is very simple; after having cut the material into suitable widths, so that one loop will just fill, without crowding one square, work from the right side holding the material underneath and pull through to top, leaving ½in. loop, and repeat in next square. The next loop will help keep the first in place, and if the material is cut correctly, they will be quite firm. When the canvas is completely covered, shear tops of loops and brush with a stiff brush and the rug is ready for use. With old stockings, pieces of flannel, fur, and wool, quaint animals can be made that will be a delight to children for birthdays, or they can be put away ready for next Christmas. Other dainty gifts can be made from pieces of lace and lengths of ribbon—covers for powder boxes, handkerchief sachets, and other toilet table accessories.

From leather and suede, with poker work and sealing wax, attractive and useful gifts can be made to put away for birthdays or for prizes for competitions at parties.

If only one new kind of work is done this winter it will help the time to pass pleasantly and more profitably.

SOAP MAKING.

[Mrs. T. D. Haines, Nelshaby.]

The materials employed in the manufacture of soap are tallow, soda, lux, resin, borax, palm oil, cocoanut oil, whale oil, seal oil, linseed oil, glycerine, &c. The effect of lye on soap is very striking. Soda lye makes a hard, compact soap, while soap produced by potash is soft. The following recipe I have made for years with success:—6lbs. fat, 1lb. caustic soda, 3 small packets lux, 36 cups water, 2 dessertspoons eucalyptus, ¼lb. resin, 2 tablespoons borax. *Method*—Cut side from a petrol tin, put all ingredients in tin with water and boil for two hours. Watch carefully to guard against it boiling over, and stir occasionally. Leave soap in tin until next day. Then turn out and cut in bars with a thin piece of wire. Stand in the sun and dry thoroughly before storing. It can be used at once, but is better left a few weeks. One cup of sugar added to the soap when boiling prevents it from shrinking in the drying process.

For the preparation of scented soaps two methods are in use; both start with a basis either of fine yellow soap or curd soap. In one process the soap is melted by superheated steam and while still hot and semi-fluid, mixed by means of a stirrer. In the cold process, the soap is first cut into shavings and coloring matters are rolled into it. Toilet soap is rather expensive to make, especially palm olive soap. Palm oil and cocoanut oil are the two oils mostly used. Honey, oatmeal, or glycerine neutralises the burning effects of caustic soda and the oil helps to soothe the skin. Caustic potash can be used instead of caustic soda. It has a much less burning power than caustic soda.

Palm olive soap.—Shred 2lbs. yellow soap into a saucepan, standing it in a frying pan of water; when dissolved, add 4ozs. palm oil, 3ozs. glycerine, and scented oil, such as oil of cinnamon or verbena. Oatmeal and glycerine soaps are much cheaper to make than some of the other toilet soaps. *Oatmeal soap.*—2lbs. soft soap, work in half cup fine oatmeal, two teaspoons lavender; add any desired coloring and set in a mould. Glycerine soap ordinarily consists of about equal parts of pure, hard soap and glycerine. The soap is melted by heat and glycerine stirred in, then poured into a mould, in which it hardens slowly into a transparent mass. When more glycerine is added it does not form so much lather. For sand-soap, add ground pumice stone. Transparent soap is prepared by drying ordinary soap, dissolving it in alcohol, and allowing the solution to remain at rest so long as any impurities remain. If pink color is wanted, carmine or cochineal is used. If brown or fawn, take one tablespoon of sugar, add half tablespoon water; boil in small saucepan until brown. For green, add a squeeze of the blue bag.

HINTS ON COOKING.

[Mrs. E. Pritchard, Gladstone.]

1. To make butter soft before using in cakes, put in basin that is warm. Put boiling water in basin, let stand for a few minutes, then empty. 2. Finish beating the ingredients of cakes or sponges with a knife and they will be light in weight. 3. If a little carb. soda melted in warm milk or water is added to a cake last, it helps to make a light cake. 4. Roll pastry on a clean sugar bag. 5. If the fruit is well mixed in with the dry flour when making a fruit cake, the fruit will not sink.

KEEPING THE FLOWER GARDEN GAY ALL THE YEAR ROUND.

[Mrs. F. Cummings, Belalie.]

Most women gardeners have a good display of flowers during spring, but many gardens look dry and withered in summer and bare in winter. A little forethought will secure at least a few flowers to brighten the garden and home during these months.

September is the time to think about making preparations for summer flowers. Petunias are very suitable for the mid-northern climate; they require very little cultivation and thrive on either rain or well water. The hotter the day the better they bloom, and a bed of Rose Queen or Purple Prince petunias will be a blaze of color during the hottest months. If possible, raise the seedlings. Plants raised in similar soil transplant more easily. A sixpenny packet of seeds will more than supply requirements—the surplus will be appreciated by a neighbor who delights in her garden. Gaillardia, Calliopsis, Scabiosa, Portulacca, Zinnias, and Phlox, if rain water is available, are some of the flowers suitable for northern gardens. Seeds sown now will give a good display during the hot months. Rooted cuttings of Chrysanthemums may be put in this month, also any rooted carnations, as these will make nice plants to bloom in autumn.

October.—In October plant Cosmos, Sunflowers, and Asters. Sunflowers do best when sown direct to the flower bed. They provide good shelter for tomatoes if the seed is sown fairly thick on the windy side of the tomato patch, besides making a good show of color for the garden. Sweet Peas should be at their best in October, but keep the flowers cut; if seed pods form the plants will soon cease to bloom. Choose a cool, cloudy day for putting out seedlings; another reason why it is best to grow your own plants. As Iceland Poppies go off, pull out the plants, dig and manure the ground, and this bed will be ready for Petunias as soon as the plants are large enough for transplanting. These will come quickly into bloom if watered freely; pinch out the centre to make the plants spread.

November.—Dahlias grow well in the north if one has a good supply of water and plenty of stable or cow manure. The plants are gross feeders. For early blooms plant the tubers in November, but tubers put out about the second week in December give the best results. Sow Phlox seed direct to the flower beds if water is suitable; bore water is not always suitable for Phlox. Top up the seed beds with sifted manure to keep the moisture from drying out. Cosmos also do better if seed is sown direct to the beds this month, or seedlings may be put out and shaded—a small tree branch or inverted flower pot will do for this. Keep the spent blooms constantly removed from the roses to lengthen the flowering period. Cut all roses with as long a stem as possible and new growths and buds will develop. A good mulch of rotted manure spread over the flower beds helps to keep the soil cool and moist and saves time, because not so much water is required.

December.—Look after the seedlings which have been planted, and water frequently. Watch for slugs and snails which soon devour the tender, green foliage. A dusting of lime will check these pests. Cut back Chrysanthemums or the plants will grow too high by flowering time. Mulch and water and the young shoots will soon make headway. Plant remainder of dahlia tubers, but do not overwater, or the plants will be too "soft" to stand the hot spells which are sure to come in January and February. Be sure to cut off all dead blooms on any flowering plants to ensure a continuation of flowers. Once the seed pods form the plants soon cease to bloom.

January.—To obtain a supply of flowers for winter and early spring seed must be raised this month. Iceland Poppy, Stocks, and Pansies are the most popular, but Leptosyne, often called "the Winter Flowering Daisy," will do well and gives a plentiful supply of blooms which are excellent for cutting. Seeds sown during hot weather require special care. Prepare the seed boxes and give a good soaking, then sow the seeds a couple of hours later. Top up with a covering of sifted rotted manure and water lightly with a fine sprinkler. Cover with a damp bag or hessian until the small plants begin to appear. Then shade during the hottest part of the day, but keep damp. It is necessary sometimes to water frequently during the day. These should be ready to plant out in March and will flower early, because they get a good start before the cold weather sets in. Keep Dahlias and Chrysanthemums watered and tied to prevent being broken with the wind. Petunias, Sunflowers, Gaillardia, Scabiosa, African Marigolds, Zinnias, and Phlox should all be gay with flowers this month and require no attention except watering and keeping the spent blooms cut.

February.—Preparations should be made for planting the first sowing of Sweet Peas, which are usually put in during March. Dig out the soil about 18in. or 2ft. deep and leave on the path to sweeten. A bed on the north side of a fence or building is ideal for winter-flowering peas. Later on put in a quantity of well decayed manure, then fill up the trench with some of the soil which was taken out; the ground is then ready for the seed. Ranunculi seed sown now will give nice blooms for decorative purposes in early spring. Cut back Carnations as their flowering period ends. Manure and water well for early autumn blooms.

March.—March is the month for general seed sowing. Most of the hardy annuals may be sown now—Antirrhinums, Cornflowers, Geums, Larkspur, Wallflowers, French Marigolds are a few of the many varieties. Plant out rooted cuttings of Carnations, also strike cuttings of good varieties. Plant Sweet Pea seeds and make a second sowing towards the end of the month, or early in April. Plant bulbs; almost all varieties are better for early planting. Daffodils, Hyanciths, Freesias, &c., will provide blooms when flowers are scarce. Disbud Dahlias for larger blooms and give plenty of water and liquid manure. Dahlias make a brilliant show.

April.—Plant out Iceland Poppies, Pansies, Stocks, and French Marigolds for early flowering. When planting bulbs, procure a few of the winter flowering Iris; they bloom in winter when flowers are scarce. Perennial Asters are at their best, but must be staked and tied or the wind will soon destroy the flowers. Stake Chrysanthemums, disbud for larger blooms, water freely, and give liquid manure.

May.—Keep Dahlias and Chrysanthemums watered freely to prolong the flowering period. Continue to put out seedlings that are large enough and attend to the Violet bed. Pull out any summer annuals which have finished blooming. Petunias may be cut back if preferred, and they will bloom again in spring. Antirrhinums also do well the second year if cut back hard.

June.—Keep the hoe in use frequently between the annuals which have been planted, and the plants will grow quicker. Plant Gladioli this month and these will produce fine flowers for cutting in spring. Plant roses, and pruning may be done at the end of this month.

July.—Finish pruning roses and shrubs, but refrain from pruning English Lilac or other spring flowering shrubs. Cut these immediately after flowering for an abundance of blooms. Violets will be coming into bloom now, watch out for slugs. These pests hide under the thick leaves. Take up and divide perennials, such as Perennial Asters, Shasta Daisy, and Aquilega. Dahlias will have gone off and should be removed from the beds and stored in a sheltered corner or in a shed. Protect from frost.

August.—As Iceland Poppies come into bud give liquid manure and plenty of water. French Marigolds will be providing a wealth of blooms at this time and are always admired for their beautiful shades of lemon and orange. Nasturtiums may be planted where they are to bloom, but protect the young plants from frost. Divide and replant Chrysanthemums, also plant some Gypsophilia for late spring flowers.

If the house has a suitable verandah pot plants will provide some very nice blooms. Facing the east Pelargoniums give a fine display in late winter and early spring. Cut back in February they bloom earlier. Asparagus Fern provides green for vases, making the most of a few flowers, and may be grown in verandahs or in the garden. Fuchsias are hardy and bloom well without any special care. One of the best flowering plants for large verandah culture is the Hydrangea. When covered with its large bunches of pale pink or white blooms it is a picture and the flowers will last for some weeks.

Flowering shrubs always brighten the garden, but each gardener must find out the kinds best suited to the soil and climate. Tecomas, of which there are several kinds, Flowering Broom, yellow and white, Veronica, and Oleander are a few of the shrubs which will thrive where one has to depend on water from a bore or well.

ART NEEDLEWORK.

[Miss J. SARGENT, Gladstone.]

To be initiated into needlework one may study from different books, which can usually be procured at any book shop. The difference between the handling of the needle in plain sewing and in embroidery is chiefly that the latter requires the utmost care to ensure evenness and regularity. In olden times, before the advent of sewing machines, women prided themselves on the almost invisible stitches in tucks and hems they were able to achieve. To-day this is not necessary, because a machine will do it equally as well. This makes "true needlework" to the present generation a pleasure. But pleasure needs care, and a careful study and practice of stitches will bring the worker more quickly to a sense of the pleasures to be had in creating articles with needle and thread.

A very good method to learn stitches is to practise them diligently on a piece of cloth upon which an example of each new stitch learned is kept for reference. In selecting the work, it is well to remember that there is just as much work in an inferior as in a good piece, but the difference is afterwards in the wear of the finished article.

Be careful about the needles. In addition to avoiding injury to the material, the work will look infinitely better if the right kind of needle is used. The mid-sizes of the crewel needles are mostly used in needlework, but I prefer a tailor's needle. When threading a needle see that the twist in the thread *will not run down from the needle.* In this way the thread will stay twisted when working and will not cause trouble by its continual knotting. The thread I prefer is the stranded D.M.C., but it is rather hard to procure at present.

Working.—Knots must never be tied in needlework; catch the thread to the linen at the back very neatly. When finished off, run the thread through some of the stitches at the back. The back of the work must be just as neat as the front. In keeping work it is advised to wash and boil it, but do not starch or blue it; this tends to rot the linen when not in use. In doing colored work, always try and blend the colors. Do not work a purple flower alongside of a red or blue one. These shades may be used, of course, but see that an autumn tint or a pretty yellow is in between. When using pale shades, see that all of them are pale, and *vice versa.*

The simplest stitches in needlework are the *Stem, Backstitch,* and *Lazy Daisy Stitch.* Many variations and additions can be made up with the Lazy Daisy. For instance, by adding one straight line of thread between each loop of the stitch, and again between each petal, a very pretty effect is produced, or another small Daisy loop around the outer edge of the flower can be added. The centres have a very real appearance if worked in one thread of green and one of lemon in tiny French knots. To do this wind the thread around the needle about three times and pull it through the material.

The old-fashioned herron-bone stitch is used a great deal and looks very pretty for a design with a large number of lines running on it, and if one does not know what to do with them, use the herron-bone or cross stitch, in one single thread, or run a thread of a different shade around through each part of the ''cross'' of the stitch, and then it will be the Craig stitch.

Solid Kensington stitch is used for solid effects when it is not desired to use satin stitch and padding. It is a continuation of long and short stitches fitting into one another until the whole space to be worked is filled. A good effect of shading flowers can be obtained by the use of different shades in each petal, commencing dark and working lighter shades towards the centre.

To make rosebuds thread the needle with about four thicknesses of thread and work over and over in the *one* spot until quite a hard little lump is formed. Then change the thread to a different shade and gradually work around the ''lump'' until a pretty rosebud is formed. The same effect can be obtained with Bullion stitch.

To make the Snail Trail stitch bring the needle up through the material and form a loop with the thread. Pass the needle through the material from the left side of the loop, drawing it through the loop. Pull tight and form a knot. Continue each stitch the same length.

There is perhaps no stitch and design for embroidery this season which is attracting more attention than the Cineraria worked in Wallachian embroidery. It is simple and quickly worked, with most delightful results, and presents no difficulty even to beginners. The characteristic of this embroidery is the simple Buttonhole stitch with which all parts of the design are worked—whether they be leaf or flower. All are worked alike, the stitches sloping slightly up from the line, which extends down the centre of each leaf or petal, to the edge, the stitch gradually becoming smaller towards the top of petal or leaf, the finish in all cases coming to the edge. The Cineraria with its vivid and wonderful tones, worked out in natural shades, makes an embroidery of rare beauty and perfect harmony of coloring.

For making cushions I favor a gatherer on a sewing machine, which gives an extremely smart appearance to any cushion.

PUDDINGS.

[Miss L. De Silver, Nelshaby.]

Whenever possible, puddings should be made in a mould or basin instead of a cloth. To turn out successfully, rub the inside of the mould thoroughly with butter. Always be careful to see that the suet or dripping is not rancid, or the whole pudding will be spoilt. When economy is an object, dripping is often substituted for suet and lard for butter. The water for a pudding should be boiling and kept boiling until the pudding is served, otherwise the pudding may be heavy. A pudding cloth dipped in boiling water prior to putting in the mixture is a great help to turning out successfully.

Cup Pudding.—One cup of bread crumbs, 1¼cups plain flour, 1 cup sugar, 1 cup dripping, 1 cup currants, 1 cup raisins, ¼lb. mixed peel, 1 tablespoon of sago, 1 teaspoon soda dissolved in the milk, enough milk to mix light. Boil two hours.

Thirty Minute Pudding.—One cup S.R. flour, 1 dessertspoon butter, ½ cup milk, 1 dessertspoon sugar, 1 egg, pinch of salt. Cream butter and sugar, add beaten egg, then milk, and lastly flour; steam 30 minutes. This pudding is very nice served with golden syrup.

Marguerite Pudding.—2ozs. butter, 2ozs. sugar, ¼lb. flour, 1 teaspoon baking powder, 1 egg and a little milk. Line a mould with jam and pour mixture in. Steam one hour. This mixture is also baked with a layer of stewed fruit underneath.

Red Caps.—One tablespoon butter, ½ small cup sugar, 1 small cup flour, ½ teaspoon baking powder, a pinch salt, 4 tablespoons jam, 2 eggs. Soften butter in basin, add sugar and beat well, break in eggs and beat well again. Mix flour, baking powder, and salt together and stir into mixture. Have four large cups buttered. Put a tablespoon of bright colored jam in each, half fill cups with mixture, place in stewpan with about an inch of boiling water, and steam for half an hour; then turn and serve at once.

Sago Cream.—Half pint milk, put into a saucepan with 1 tablespoon sago; when boiling have ready ½ pint milk, 1 cup sugar with yolks of 2 eggs well beaten. Pour into boiling sago, and bring to the boil. Pour into a dish and stir whites of eggs well whipped in. Serve cold.

Lemon Sago Jelly.—One breakfast cup sago, 1½ cups water, 1 cup sugar, 2 large tablespoons treacle, 2 lemons. Soak sago in water for half an hour, add sugar, treacle, and grated lemon peel. Boil until quite clear, then add lemon juice. Pour into mould and leave until cold.

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C. F. ANDERSON, Poultry Expert.

CONFERENCE AT PENOLA.

[Papers read at Women's Session, Penola Conference, March 8th, 1933.]

PASTRY MAKING.

[*Mrs. W. Balnaves, Penola.*]

The quality especially to be desired in pastry is lightness, and this depends almost entirely on the amount of cold air in the pastry when expansion takes place in the oven. The best pastry, therefore, is that which contains the greatest quantity of cold air prior to baking. The repeated foldings and rollings, to which puff pastry is subjected, have this increase of air in view, while in short crust the expansion is aided by adding baking powder, &c. Self-raising flour may be used for short crust, therefore a marble slab is the best to use on which to roll the pastry. Puff pastry must also be handled very lightly and quickly and cooked in a hot oven. For short crust the less water used the shorter the crust and the less flour used the better it will be; rub the butter in lightly with the finger tips. Roll pastry with a firm, even pressure away from you; never sideways. When cutting pastry make a clean, decisive cut and leave no ragged edges. Do not cover a pie dish with pastry while its contents are hot or the steam will make the under layer of pastry sodden. When making meat pies, make a small hole in the pastry that is covering the pies to let the gas escape. Do not open the oven for the first five minutes after the pastry is placed in the oven. Tarts cooked without a filling should be pricked to prevent their rising. Mix the pastry to the same consistency as the butter; that is, if the butter is firm so the pastry must be firm. Short crust is used for Cornish pasties and all fruit pies, except apple pie, and puff pastry for apple pie and all meat pies. To glaze meat pies brush with yolk of egg to give a nice brown color when cooked, and for fruit pies glaze with white of egg and sugar to give a nice light brown color. Test the oven; if a little flour is sprinkled on a cold slide and placed in the oven, and if it becomes a dark brown color in 30 secs. the oven is the right heat.

Puff Pastry.—1lb. flour, 14ozs. butter, a little salt and lemon juice. Sift the flour and add 2ozs. butter, rubbed lightly in. Mix to a firm paste with cold water and lemon juice; roll out to a long, narrow strip, divide remaining butter into three equal parts; put one portion on the paste in small pieces, dredge very lightly with flour, fold evenly in three, and turn it round to have the folded edges to the right and left. When rolling, press the edges lightly together with the rolling pin to prevent the air escaping, and roll as before. Repeat this process with other portions of the butter; roll out once more the same without butter. This pastry may be used at once, but is lighter if left to stand one hour before using or left for 15 minutes between each turn.

Short Crust.—½lb. flour, ½ teaspoon baking powder, ¼lb. clarified fat or butter. Rub lightly into the flour which has baking powder and salt added, mix to firm dough with water. If a sweet crust is needed, add 1 teaspoon sugar.

ICING AND DECORATING A CHRISTMAS CAKE.

[*Mrs. W. L. Redman, Penola.*]

Icing and decorating is simple and fascinating. Simple, because a simple design is most effective, and fascinating because when decorating you have to design, and to design anything is a pleasure. At first we feel as though we must have a copy, but that feeling passes away and we delight in drawing our own designs.

One of the first things to consider is the icing sugar, and there are a few points which are worth attention. For icing an ordinary cake quality 2 is quite all right; it is softer and easier to use. For decorating I prefer quality 1; this sugar is often condemned, as it forms very hard lumps which have to be broken and then well sifted before using. Some people just roll with a rolling pin and do not sift it; but sifting is very necessary and makes the icing easier to mix; it makes a smoother icing than quality 2, which adds to the appearance of the finished article and makes the icing syringe easier to manipulate. If any lumps are left in the sugar they will stop the flow of icing from the pipes.

Before commencing to ice a cake I take a piece of light wood or strong cardboard, cover it with greaseproof paper or a fancy paper d'oyley, then cut the top of the cake level and turn it upside down on the board and lightly rub flour all over the cake. Turning the cake upside down gives a nice level surface for icing. I then cover with almond or mock almond icing—mock being cheaper and very nice. Recipe is as

follows:—1 egg yolk, well beaten, and 1 tablespoon melted butter, 1 teaspoon lemon juice, 2 tablespoons hot water, ½lb. icing sugar, ½ cup cocoanut, and essence of ratafia to taste. Spread smoothly on cake and allow it to dry.

The cake is then given two coats of royal icing, which I always mix in this way: Into about ½lb. sugar put the white of a fresh egg and stir with a wooden spatula until the egg has taken up all the sugar, then beat it all one way for about 15 to 20 minutes, then add 1 dessertspoon of lemon juice, 1 teaspoon of glycerine, and 2 drops of liquid blue (prepared in manner given later). Give the icing a few more turns until it has a good body. Place several folds of damp cloth over the basin and it will keep in good condition for several days; a little more sugar will have to be added before using.

Liquid Blue.—Crush a cake of common blue to powder, add 2 tablespoons of water and place in a bottle, shake well, let stand until blue is dissolved. Always shake before using. I then add 2 dabs from the wet cork on the icing, which is safer than trying to pour two drops out, as icing must not look blue, which it will do if not very careful. I always use a wooden spatula. A good one can be made from a small butter pat, shaving each side down until it is about 2in. across.

The royal icing must be put on evenly and each coat allowed to dry; smooth with a knife that has been dipped in hot water. The cake can then be glazed and is ready for piping. To glaze, I add enough warm water to the royal icing to allow it to flow evenly over the cake; do not smooth with knife.

The South Eastern Women's Branches take an active interest in Conferences. There were over 100 members and visitors at the afternoon session at Penola.

Draw a design on greaseproof paper, pin on cake and prick the design on to the cake with a fine knitting needle and remove the paper. You must not conclude that piping can be acquired in a few hours; patience, perserverance, and above all, constant practice will be required before you will become proficient.

It is a good plan to place a sheet of glass over the design and practice on that. The icing can be lifted off and replaced in the basin and used again after a few beats with the spatula. You will soon learn when the icing is the right consistency. Do not have it too stiff; that is often the cause of the syringe being hard to work.

I have used a "Tala" outfit for years and have found it highly satisfactory. Always wash and dry as soon as finished with; do not screw the bottom screw too tight, this is another cause for the syringe being hard to work. Tubes Nos. 1, 2, 5, 8, 12, 26 I find the most useful, and quite a number of designs can be made with one tube by holding the syringe at different angles.

The coloring of the icing and decoration is left to the individual taste, but never be crude in the coloring.

FIRST AID.

[*Mrs. E. C. Schinckel, Kybybolite.*]

Being a very wide subject I have endeavored to apply my remarks to those things which our daily lives bring us most in contact with, more than the orthodox rules laid down in first aid books. I interpret "First Aid" as meaning the application of a few simple rules and remedies until medical aid can be sought.

Shock.—With almost any injury there is a condition of shock to a greater or lesser degree, according to the extent of injury and temperament of the patient. Shock is really a prostration of vital forces, and the most easily recognised symptoms are pallor and sighing type of breathing, general weakness and cold exterior. *Treatment*: Loosen all clothing, keep head low, patient in recumbent position; if possible, apply warm covering and heat to extremities, and plenty of fresh air. If patient is conscious give warm drinks, such as coffee, tea, or hot milk.

Burns or Scalds.—Although one is caused by dry heat and the other moist, the emergency treatment of each is the same. The treatment for shock is usually the first to be attempted. Even with minor burns there is a certain degree of shock. When removing clothing do so with utmost care to prevent breaking blisters which may have formed. For general burns, picric solution is the ideal treatment, and I would recommend all good housewives to keep a bottle of this splendid solution in a handy place. Simply saturate a piece of clean, soft linen with full strength solution and apply very wet. Another very good treatment is carron oil applied in same way. For burns about face and eyes I prefer carron oil. For burns about the eyes a few drops of olive or castor oil or a smear of vaseline is very helpful until medically treated. The most easily obtained home treatment for burns is a solution of bi-carbonate of soda, 1 dessertspoonful to pint of water, saturate and apply.

FOREIGN BODY IN EAR OR EYE.

Eye.—Prevent patient from rubbing the eye. If the foreign body is something soluble, bathing will invariably wash it out. If an eye bath is not handy, an ordinary egg cup may be used quite satisfactorily. A lotion of salt, 1 teaspoon to 1 pint of water or boracic of same strength is always a safe treatment. If foreign body will not wash out, place patient in recumbent position, stand behind patient, evert lower lid by gently drawing down, making pressure on cheek bone and gently squeeze or pour luke warm lotion through eye, from within. To evert upper lid induce patient to look down, gently draw down lid and then turn back and run lotion through in same way as lower. Patient may be able to remove loose substance by pushing lower lid up and drawing upper lid over it; thus the lower lashes may remove whatever is causing trouble. If anything has penetrated eye do not attempt to move unless easily got hold of, as further damage may be caused. Place a pad and bandage over eye to prevent movement and obtain medical aid with all speed. The utmost care and gentleness should always be used in treating the eye. Never apply disinfectants or strong lotions to the eye.

Ear.—Should foreign body be anything soft, such as insect, &c., it can usually be removed by gentle syringing with warm lotion. To syringe, hold the ear by lower lobe and draw backwards and upwards.

Bleeding.—The ideal treatment for profuse external bleeding is direct pressure over main artery surrounding the part, but the first aider would need to have a thorough knowledge of the principal arteries and pressure points. For profuse bleeding from a wound, alternate applications of hot and cold will assist blood clotting. For internal bleeding keep patient quiet in recumbent position and apply heat to extremities.

Nose Bleeding.—Can usually be checked by elevating arms and head. Apply cold compress to back of neck, forehead, and bridge of nose. Have patient in a current of air if possible and induce to breathe through mouth.

Snake Bite.—To prevent poison being carried to the heart, apply pressure between bite and heart; apply bandage tightly of string, tape, or rolled handkerchief. Keep affected part low to encourage bleeding and discourage flow of blood to heart, placing wound in warm water will also encourage bleeding. Scratch or scarify skin over and around wound and rub in powdered Condy's crystals. Cover with clean dressing, support the part and treat for shock.

Stings of Insects.—Mop the part freely with diluted ammonia or solution of soda bi-carb.

Wounds.—The principal thought in treatment of wounds should be surgical cleanliness. The first aider should wash his hands if possible and have everything in treatment of wounds as sterile as circumstances will permit. Bathe wounds with good cleansing lotion such as salt and water, boracic and water or lysol, all of the same strength, 1 teaspoon to pint. Always bathe wounds from within and do not return cotton wool to basin after once having touched wound. When satisfied that a wound is clean, paint with tincture of iodine and apply clean, dry dressing. A mild sterilised ointment may be applied on dressing to prevent sticking, but is unnecessary to assist healing. If a wound is kept thoroughly clean Nature needs no assistance towards healing.

Sprains.—A sprain is wrenching or twisting of a joint, causing stretching of ligaments and tendons. A sprained limb should be elevated and supported and treated with very hot or very cold applications, or both alternatively.

Treatment of Apparently Drowned.—See that throat is clear of anything that may have been swallowed, also bring tongue forward. Loosen all clothing and endeavor to empty stomach of water by lying patient forward and lifting from waist. Proceed with artificial respiration, patient lying forward with head turned sideways and pressure applied over lower ribs from back. Apply rugs and heat to extremities as quickly as possible.

Fainting.—Is really an enfeeblement of heart's action. It may become unconscious or semi-conscious. If a person threatened with fainting bends forward so that head is lower than knees as soon as he feels dizzy, the attack may be averted. In treatment, fresh air is essential. Place patient lying down if possible, loosen all clothing. A little cold water sprinkled on face will cause forced inspiration and thus shorten attack. Smelling salts or ammonia by inhalation is very helpful.

Insensibility.—May be due to many causes, but a few simple rules will be helpful in most cases. Lay patient on back and turn head to one side. Loosen clothing. If face is pale, the brain is not getting sufficient blood, and so keep head low and elevate legs. If face is flushed or dusky, too much blood is in head, and so raise head and shoulders. See there is plenty of fresh air; do not allow people to crowd around; do not give food or fluids while patient is insensible. Apply warmth to extremities.

Sunstroke.—Usually due to direct rays of sun and being sheltered from wind. Usually marked by intense headache and dryness of skin. Very high temperature and unconsciousness. Flushed face, noisy breathing, weak pulse. Treat by removing patient to cool and shady place. Strip to waist, keep head and shoulders elevated. Apply coldest water available to head, neck, and spine. Fan vigorously.

WOOLLEN MATTRESSES AND QUILTS.

[*Mrs. W. Varcoe (Millicent).*]

Now that wool is so cheap it will repay others besides the farmer's wife to make mattresses and quilts with wool for a filling. It is a cheaper filling for pillows, mattresses, cushions, and quilts than kapoc or the flocks one can buy from stores. A well-made wool mattress will last a lifetime. Choose a coarse wool, such as the wool from Lincoln, Southdown, or a strong cross-bred sheep.

First, shake the fleece to remove dust. Very stained and dirty pieces must be removed. Plenty of good rain-water is required for washing the wool. Prepare the water for washing by boiling with about 8ozs. of soap to every 4galls. of water. Wash one fleece at a time. Nearly fill the tub with warm water. Divide the fleece into six or more pieces, put into water, squeeze and work it about in the tub for about 10 minutes, then squeeze and put into a second tub of hot, soapy water; repeat the process and then rinse in a tub of clean rainwater. Squeeze and again rinse in a second tub of clean water. All traces of soap must be removed. If the wool is only required for filling a mattress or pillows, give it one wash in warm soapy water, and then put it in the copper with plenty of soap and water and boil for a few minutes; then rinse well. Boiling will make it lose its whiteness, but is an easier method of cleansing very greasy wool. An ordinary wringer will provide a quick and satisfactory means of squeezing out the water between washings and before spreading out to dry. A long piece of calico or similar material twice the width of the wringer will be found of value if folded double and the wool placed between as it prevents the fibres winding round the rollers. The lawn or any clean, grassy place, free from grass seeds, will do for a drying ground. Choose a warm, sunny day, spread the wool out well and it will dry in a day if put out in the morning. When it is thoroughly dry tease it out, and with a large, sharp pair of scissors or shears, cut into about 2in. lengths and fill the mattress with it. It requires about 3lbs. for the usual size pillow and 18lbs. to fill a single bed mattress.

To make a quilt, take two pieces of good, strong cretonne, chintz or a pretty floral print, measure about 6in. larger than needed for the quilt to be when finished. Put the two right sides together and sew down each side, and across one end. Then turn right side out, run rows of stitching from the top to bottom about 4in. or 6in. apart, fill each row with wool to the desired thickness for a depth of 4in. or 6in., machine a row of stitching across from side to side. Repeat filling and stitching until the top is reached. Machine the top edges together and bind all round the quilt with a binding of matching color. This will make a quilt equal to eiderdown and much cheaper than one made with kapoc.

LITERATURE IN THE HOME.

[*Mrs. L. J. Cook (Kybybolite).*]

The word "literature" means learning; it also means a collection of books, and a book is a written or printed composition. The origin of books goes back to a very remote antiquity. The word itself is, in Saxon, boc, yet it appears originally in Gothic as a plural noun, meaning as is generally believed, the runes inscribed on the bark of separate branches of the beech tree. Liber in Latin means bark, and is applied to papyrus on account of its bark-like appearance. Liber is also the source of our English word "library." Speaking of papyrus, this very ancient material was prepared from the papyrus plant, which is a kind of sedge, 8ft. to 10ft. high, with a strong, woody root, and naked triangular soft stems, which at the base are often as thick as a man's arm. At the top it has numerous drooping spikelets, its leaves are long and sharp; it was grown in pools of still water, and the papyrus or paper of the ancient Egyptians was made from its pith. The strips of pith were laid side by side, then other layers were put crosswise, and the whole moistened with water from the River Nile, pressed and dried, then smoothed by rubbing with ivory or a smooth shell.

The ancient Babylonians and Assyrians had a wide and varied literature, preserved in two ways—either painted on the leaves of the papyrus which grew on the banks of the Euphrates, or impressed upon clay tablets or cylinders. Great skill was shown in this latter method, as often the characters were so minute as to suggest having been written by the aid of a magnifying glass. The defect of this form of book is obvious, and has no direct connection with our books of to-day. With the Egyptians, however, the sequence is maintained, from the volume on our book shelves to-day back through the ages for thousands of years. The ancient papyrus book, whether Egyptian, Greek, or Roman, was in appearance very like our mounted maps of the present day, that is, a length of material was written upon, on one side only, and fastened to a wooden roller on which it was wound. Some of these are still in existence and extend upwards to 20yds. and sometimes 40yds.

One can easily understand the inconvenience attached to consulting this type of literature, therefore it was usual for any very lengthy literary production to be written in sections and put on separate rollers. In Egypt these rolls were kept in jars (about 9 or 10 in each), and in Rome in wooden boxes or parchment cases. The change from the roller to the folded form of book seems to have taken place in the ancient world after the adoption of vellum or parchment, the latter being made from the skins of sheep, goats, and calves. Vellum or very fine parchment was made from skins of kids, lambs, and very young calves. Vegetable parchment is quite a modern art, first appearing about 1853, and is made by dipping ordinary insized paper into a solution of concentrated sulphuric acid mixed with water, then quickly removing all traces of acid, and drying. The folder form of book remained practically unaltered throughout the Middle Ages, and being even more suitable for paper than vellum, was ready when printing finally brought books to their present state.

"Paper" is derived from the word "papyrus," and did not become common until the 14th century. Practically any fibrous vegetable material can be used for paper making, also cotton and linen rags, but by far the greater amount of paper in the world to-day is made from wood pulp. Esparto (a Spanish grass) is also used, and linen and cotton rags are still in use for very fine paper.

The printed book was first issued like a manuscript without numbering of pages, but before very long numbers were adopted.

We now come to book-binding, which is the art of connecting together the several parts of the book, and before the advent of printing this binding was being done by monks, who prepared the books for ornamentation by the goldsmiths and jewellers. It was not until the 15th century that book-binding became an art of itself.

We will pass to literature. History records the deeds of a people; literature tells its character. English literature represents a people, showing through generations a desire to find the right and root out the wrong, and its most distinctive mark is a religious sense of duty. In English literature we have some of the greatest literary geniuses the world has known, and the immortal Shakespeare is its crowning glory. All British people should be lovers of good literature and endeavor to fill their book-cases with good books, for just as the literature of a nation shows the life of its people, so the literature in the home shows to a certain extent the character of its inmates. Where a book case is full of the light and trivial form of novels one cannot help but feel that the owners have little love for high ideals and beautiful language, while the book-cases containing only the best books show us persons with a love of the beautiful, both in language and thought. We often hear a person spoken of as a great reader. Now this term can apply in two ways: Firstly, to the reader whose reading is great because they have read the great in literature, and secondly, to the reader whose reading is great only in regard to the number of novels, magazines, &c., that they have managed to get through. By this I do not mean to imply that one should never read light literature, because occasionally we all like a light novel of the modern type—a good detective yarn or a story of adventure. Good literature is a great teacher, it educates us to a broader outlook on life, to high ideals, and to a love for that which is noble and good. It has a refining influence on our characters, and where there are children in the home, parents should foster in them a love of good books—such works as Lamb's "Tales from Shakespeare," Sir Walter Scott's "Tales of a Grandfather," "Robinson Crusoe," "Gulliver's Travels," "Tom Brown's Schooldays," "Peter the Whaler," the books of Jules Verne, Louis Stevenson's "Treasure Island," &c. There are also some delightful fairy books such as Hans Andersen's "English Fairy Tales," Kingsley's "Greek Fairy Tales," "Celtic Fairy Tales," "Japanese Fairy Tales," and "Old Indian Legends."

This, of course, is only a very short list of the many good books for boys and girls, but they are far better reading for young people than the cheap detective and highwayman type of book which not only destroy their sense of good literature, but are often very harmful to their character.

I will now speak of literature for older people. Every home should have a Shakespeare, a good dictionary, an encyclopaedia, History of England, and for Australians a History of Australia, then novels by Scott, Dickens, Thackeray, Mark Twain, Hardy, and our great English woman novelist "George Eliot." The novels of the French writer, Alexander Dumas, are very interesting and quite worth a place on the book shelf. A few of the poets should be included such as Milton, Wordsworth, Longfellow, Scott, Burns, and in Australian homes Adam Lindsay Gordon. Other good books are Emerson's "Essays," "Legends of Ancient Greece," "Legends of Ancient Egypt," and a very interesting book is Pepys' Diary.

Of the 20th Century writers, Galsworthy, Arnold Bennett, H. G. Wells, Joseph Conrad are among the best. A few good books of travel, some biographies of famous people, and such books as Sir Phillip Gibbs' "Day after To-morrow" are all worth a place in the home. With regard to the ordinary novel, I would suggest buying just a few of the very best, because they are usually read only once, afterwards merely crowding out the bookcase, and by joining a good library one can easily get this type of literature. There are, of course, many other great works, both English and foreign, also histories of other lands, all of which are very interesting but far too numerous to speak of now. My endeavor has been to give a fairly wide scope of reading in a home where book space is limited.

HOME TRAINING OF A CHILD.

[*Mrs. E. Telfer (Tantanoola).*]

The training of a child should begin when it is a tiny baby in the cradle. It should not be taken up every time it cries. A good cry does the child good, it expands the lungs and helps to make a healthy child. Do not keep a young baby closed up inside, give it all the fresh air possible, but avoid draughts. As soon as the baby has had its bath and been fed it should be put outside in its pram, and if the day is nice and fine leave it out all day.

The baby must not be left on one side too long; this is most important. If a child is left lying continuously on one side it often causes "cross eyes." As soon as the child is old enough to sit up, a good shady tree is the best place to leave the pram. The small birds flying in the branches and the wind blowing the boughs amuse the child for quite a long time. The child must have good nourishing food and be fed regularly. As the child grows older teach it to play games with other children and have other little ones' company so that when it is ready for school it is not shy among the other children. The parents must be firm; never allow the child to "answer back," and keep a close watch on it. Teach children to be honest, that is one of the greatest things in life. A mistake is often made by parents allowing their children too much pocket money. That teaches them to be extravagant. Parents should see that their children are in at a proper hour. Give them some work to do. The little ones love to help mother. Give them a little apron and a cap; see what a lot they will try and do! Do not give them too much work. They need plenty of play. When a child reaches the age of 14 or 15 he needs more looking after, as a boy thinks he is a man then and thinks he should do as other men do. Parents should be very firm with their children at that age and should not give them too much freedom, because so much depends on the rising generation. Australia wants good men and women.

FRUITY DESERTS.

[*Mrs. T. Kidman (Penola).*]

Fruit and cream are acknowledged to be an ideal sweet for hot days. The value of fruit as an article of diet is well known, and it is a recognised fact that it should have a place on every table. Although some fruits are not of much service as far as food is concerned, owing to the large quantity of water they contain they are valuable on account of their mineral salts, which help to purify the blood and to keep the body in good condition. They also supply water in a palatable and refreshing form, and their flavor and juiciness help to stimulate the appetite. Fresh fruit prettily arranged is always beautiful and inviting, and can be eaten without danger by those who are healthy. Others, however, find they can take it more easily in a cooked form, and for this reason it is useful to know how to prepare it in different ways. Some fruits should be given children every day. Oranges, apples, or stewed prunes are most to be depended on by physicians. The woman who in the summer spends many hours bottling fruit, in winter has her reward by having the fruits to serve in dessert to her family. Eat more fruit, it will improve your health as well as help your country. The only fruit unsuitable for children is the cherry, which is very indigestible, either cooked or uncooked. With the aid of Crispies, Puffed Wheat, or Rice Bubbles, fruit may be served very temptingly.

Fruit Salads.—Almost any kind of fruit may be used in the making of a salad, such as strawberries, oranges, bananas, apples, grapes, pears, apricots, peaches, and many others. In winter when fruit is scarce, the bottled varieties will form a very welcome addition. Sometimes chopped almonds or walnuts or cocoanuts are used with the salad. Fresh fruit for salads must be perfectly ripe. Hard, unripe morsels will spoil a salad. It is generally carefully prepared and cut into small pieces. Oranges should be skinned and every particle of white pith removed from them. All cutting of fruit should be done with a sharp knife.

The dressing of fruit salad is generally composed of a syrup by sprinkling sugar over the fruit. The juicy fruits require less liquid than the drier kinds. If wine is used in the salad it is a matter of taste; some use dark, some light, and some none at all. A fruit salad may be served in bowls or glass dishes or glass cups. It should be allowed to stand for some time after the dressing is poured over it, and the colder it is kept the better.

The following recipes are merely suggested, and the variety may be limited by the means of materials at disposal:—

Cocoanut Delight.—Five or six oranges sliced finely and sprinkled with sugar; then sprinkle over top grated cocoanut or chips.

Fruit Dessert.—1lb. prunes, simmer 1 hour with sugar, take stones out and fill each prune with cocoanut chips, set in salad bowl and serve with prune juice boiled down with a piece of lemon. A little cream is an improvement.

Desserts like these save flour, eggs, and other needed things, because they take the place of desserts which contain them.

Short Cake.—Cut a plain cake in layers, between each layer spread cooked peaches and whipped cream. This dish with juicy pears is very delicious.

Aunt Jemina's Pancakes.—¼lb. of flour, a little salt, tablespoon melted butter, whites of two eggs, little tepid water or milk. Mix ingredients and then beat whites of eggs to a stiff froth and fold in lightly. Let stand half an hour if possible, grate an apple and add to mixture, drop into frying fat and then drain on brown paper. Serve sprinkled with sugar.

Peach Blancmange.—Line a mould or pudding dish with peaches. Have ready some blancmange, whilst still warm pour over fruit, and when set turn out. If bottled fruit is used the syrup may be added to the blancmange.

Apple Tarts, for school lunches. Line some patty pans or containers with good pastry or biscuit mixture. If any stewed apples are left from the day before, put a spoonful in each tart, then pour over the apple a little of the following mixture:—1 egg, 1 tablespoon butter, ½ cup sugar, 1 tablespoon dessicated cocoanut, a little vanilla and salt. Cook and serve either hot or cold. May be made on a large plate—just as successful and they are very appetising.

Fruit also done up in different ways with gelatine is very nutritious.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Penola	24/2/33	33 and 17 visitors	Address—Miss Bignell ...	Mrs. E. Kidman
Mangalo	9/11/32	14	Demonstration—Mrs. Coles	Mrs. B. Coles
McLaren Flat ..	4/3/33	20	Biscuit Recipes	Mrs. A. Rogers
Saddleworth ...	7/3/33	9	Conference Report	Miss G. Frost
Mangalo	8/3/33	9	" Preserving Vegetables "	Mrs. B. Coles
Wasleys	2/3/33	37	Address—Mrs. Maloney .	Miss G. George
Parilla	15/2/33	18	Biscuit Competition	Mrs. R. Welden
Parilla	8/3/33	14	" Fruit Dipping "—Mrs. Foale	Mrs. R. Welden
Coonawarra ...	15/3/33	23	Address—Dr. H. Bourke	Mrs. F. Skinner

MEN'S BRANCHES.

SOUTH-EASTERN.

FRANCES (Average annual rainfall, 19.99in.).

March 9th.—Present: 10 members.

Mr. C. M. Adams read the following paper on "Breeding Merino Sheep":—"Merino wool has always been Australia's chief product, and this district in particular has proved very favorable for Merino sheep ever since the land was first occupied. In breeding stock of any kind, the sire pays a very important part. The ram is the main consideration in improving and maintaining the standard of the flock. When selecting a ram, the first point to consider is a flock master with the reputation of breeding rams that leave good stock. The appearance of a ram is a guide in purchasing. A fine upstanding ram, with a bold, masculine face, is generally of a sound constitution, which is a very important factor. In conformation the ram should stand squarely on his four feet, have good square hips, well sprung, not too long, yet not too short that would make the head appear too close to the shoulders. He should have a good, deep front, with a few folds on the neck, but free from body wrinkles. A plain tail is much better than a wide, crinkley one, which is hard to keep clean and free from flies. The wool should be as near as possible the same class on the shoulder, ribs, and thigh. It is generally a little shorter on the hindquarters, but it should not vary to any great extent. The fleece should be of good length and color, and fairly dense, well covered on the belly and legs, continuing down to the hoof. If one always breeds only from the best ewes, and mates them with good rams, the flock should soon show a marked improvement. A ewe should be of good frame for breeding, big ewes are generally the best mothers. Constantly culling any inferior woolled ewes and breeding only from the best, together with providing them with ample feed will go a long way to raising the standard of the flock." (Secretary, E. Pfitzner.)

There was a good attendance at the Penola Conference, and delegates came from Penola, Coonawarra, Mount Gambier, Kybybolite, Allandale East, Tatiara, Mundalla, Millicent, Kalangadoo, and Tantanoola.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Mundalla	9/3/33	21	Address—H. B. Barlow	A. Ross
Tantanoola	4/3/33	9	Discussion	H. Kennedy
Mt. Gambier	10/3/33	11	"Fertilisers," K. Collins	G. Gurry

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Wilmington ...	7/3/33	18	Address—Dr. H. Krause .	C. Cole
Morchard	—/2/33	8	Question Box	A. McCallum

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BEETALOO VALLEY (Average annual rainfall, 23.50in.).
February 6th.—Present: Nine members.

Harvest Reports.—Members' reports on this year's harvest were generally satisfactory, but owing to the abrupt finish of the season many varieties never yielded up to expectations. Currawa, Nabawa, and Waratah were outstanding. Harvesting terminated very late, owing mainly to cool weather and because farmers had to handle so much "down" crop of the earlier varieties—result of heavy winter rains. Mr. P. Curtin: Waratah and Nabawa, 8 bags; Sepoy, 7 bags per acre. Messrs. J. Halse and J. Arthur: Nabawa and Currawa, 6 bags. Mr. T. Jones received 6 bags per acre from Currawa, and Nabawa 4 bags. Mr. J. Fradd obtained best results from Currawa. Mr. E. Sporn reported poor results from Nabawa, with Currawa slightly better. Gardening members all reported very light orange crop for coming year, and good crops of apples and pears. Mr. E. L. Orchard gave reports on yields of wheat in other districts. (Secretary, B. Giddings.)

MURRAYTOWN.
February 11th.—Present: 10 members.

Mr. S. Jackson on a small area had a return of 6 bush. Mr. A. Clogg said 100 acres of Federation gave 12bush. per acre. Farm average, 21bush. Sowed 60lbs. seed, 60lbs. super. Mr. B. Starr: Federation, 12bush.; Ranee, 24bush.; Free Gallipoli, 21bush.; Nizam, 18bush.; Felix, 15bush. Barley was a failure, and sowed 65lbs. wheat, 75lbs. super. Mr. F. Borgas said his best wheat was Free Gallipoli. Ranee produced very small grain, owing to rust. Mr. W. Joppich: Sultan, 24bush.; Nabawa, 22bush.; Ranee (light straw), 21 bush; Free Gallipoli, 21bush.; German Wonder, 20bush.; Federation, 17bush. Mr. W. Ryan: Ranee, 15bush.; Federation, 6bush. Sowed 75lbs. wheat and 70lbs. super. Mr. E. Bonham reported an average wheat yield of 12bush. Mr. Wade: Federation, 15bush., and Ranee, 18bush. Mr. N. Scholz sowed 60lbs. seed, 60lbs. super: Onas, 6bush.; Felix, 12bush.; Nabawa, 24bush.; Sultan, 15bush.; Ranee, 15bush. to 24bush. Currawa was the only wheat free from rust. The Hon. Secretary said he recorded 29in. of rain for 1932. Seeding started on fallow on April 24th, and was finished on new land July 19th and 20th. A small area of Sword gave 28bush.; Marshalls' No. 3, 21bush.; Ranee, from 6bush. to 29bush.; Leno (a new wheat), 25bush.; Pennyhead and Federation gave only very small pinched grain of unsaleable quality. Rust and frost played havoc with the crops. Farm average from 353 acres of wheat 6½bush. of saleable wheat. Early Burt oats sown late were practically a failure. (Secretary, E. Pitman.)

NELSHABY (Average annual rainfall, 17in.).
January 12th.—Present: 10 members.

A Retrospect of Season 1932.—Mr. H. Williams read the following paper:—"The 1932 season has been a remarkable year, but in this district a most disappointing one. January was hot, with the thermometer well over the century for several days. Bush fires did not improve matters, but fortunately, owing to the ready response of volunteers, they were quelled before much damage was done. February 4th saw the dry spell broken when 2¼in. of rain fell, which brought up a prolific growth of weeds on fallows. About 2½in. fell in March, which brought up more rubbish, and teams were kept very busy. During April ½in. of rain fell, which induced many farmers to start sowing earlier than usual. The good rains, together with the forecast that wheat would be about 3s. 6d. a bushel for 1932-3 harvest, encouraged many to sow a larger acreage in the hope of retrieving their losses for the last few years. About an inch of rain was registered in May, over 2in. in June, and 1¼in. for July. Severe frosts were experienced in July, which destroyed a lot of pea and tomato crops, also some early wheat that was in head. Owing to the copious early rains there was an abundance of feed, and stock were in good condition. Farmers were able to do most of their fallowing without feeding their horses on hay. In August rust appeared, and, owing to the rank growth, due to the early heavy rains and absence of usual drying winds in winter and spring, spread rapidly, causing many to cut more hay than they would have done. Some varieties of wheat resisted rust better than others, notably, Florence, Quality, Ford, Nabawa, and Currawa. Gluyas, which has been grown in this district over 30 years and was considered rust resisting, was badly affected. Fair weather was experienced for getting in the hay, there being no heavy rain to damage it. When the harvesters were put into the crops most farmers found that rust was worse than they feared, and not only was the quantity lacking, but also quality, much of it being practically unsaleable. The price was in the vicinity of 2s. 6d. Cool weather retarded harvesting somewhat, but fortunately no rain fell to bleach the grain. Heavy gales in October knocked the tall crops about rather badly, necessitating the use of crop lifters and false combs. Patches of Currawa were broken off at the ground. It evidently had footrot, and some difficulty was experienced in reaping it with the stripper harvester, for as soon as the comb touched it it would break off and choke, especially in the thin patches. It was a good grain not blighted. The thicker rank patches did not break off so much, although the grain was not so good. During the first half of the year prospects were never brighter, and farmers ordered cornsacks freely, but unfortunately many bales remain on farms unfilled.'' (Secretary, A. Lawrie.)

WIRRABARA (Average annual rainfall, 19.21in.).

October 27th.—Present: Nine members.

Fowls on the Farm.—Mr. W. H. Stevens read the following paper:—''First select the breed that will best suit local conditions. In a district a long way from the export market the heavy breeds of fowls are favored; the hens bring a better price when they are sold after two or three laying seasons. A few hens for breeding purposes can be kept a year or two longer if they are of a good strain. It is a good plan to use roosters a year older than the hens when mating a pen for breeding. Of the heavy breeds I recommend the laying strain of Black Orpington, Rhode Island Red, and Barred Rock. The latter is a good table fowl, but not so good for laying, and the hens lay rather small eggs. A cross with the Black Minorca hen and the Black Orpington cockerel produces a medium sized hen, and a good layer of large eggs. In the light breeds the White Leghorn, with the Minorca and the Brown Leghorn are easily best. They all lay large eggs, which are essential for top prices and for export. When fowls are kept with the object of exporting eggs, house the hens in winter and feed them mash in the morning consisting of 2 parts bran and 1 of pollard, greenfeed at mid-day, and dry corn at night. At least 100 hens are necessary to make it worth while sending eggs to market twice a week. The rail freight to Adelaide would take the extra price that you would be paid above ordinary shop eggs. A house to accommadote 100 hens would cost about £35 complete. It would take 4 sq. ft. to every fowl. Eggs for export must not have dirty spots on them, nor be washed in water, and must be 2ozs. in weight. In making a house for the hens, it is a good plan to put a piece of wire netting under the roosts, so that the droppings do not get mixed up with the straw that is put in for the hens to scratch to keep them active in cold weather. A box, provided with a lid, half full of sand and placed outside the house makes the best nest. The eggs can be collected without going into the house. A petrol tin with a hole cut in both sides is handy for a water vessel. It can be hung to the top of the shed and any height from the ground, so that the fowls do not scratch straw into the drinking water. The water must be changed often, and the drinking vessel cleaned every few days; dirty water will soon cause disease in hot weather. A little Epsom salts in the water in very hot weather assists in keeping the birds healthy.'' (Secretary, F. Borgas.)

February 11th.—Present: 14 members.

Harvest Reports.—Mr. H. Jaeschke: Early African and Ranee, 9 bags; Nabawa, 8 bags; Waratah (half paddock summer fallow), 7 bags. Average for farm, 25bush. Mr. W. Steven: Canberra and Nabawa (down badly), 21bush. and 22½bush. respectively; Energetic (on stubble), 10bush.; Ranee (slightly frost bitten), 23bush. Farm average, 18bush. Mr. M. Rafftry: Ranee (badly frost bitten), 10bush.; O.B. (slightly frost bitten), 16bush. Average, 12bush. Mr. J. Hollitt: Free Gallipoli, 4 bags; Merridin and Ranee (weighed exceedingly heavy), 6 bags; Nabawa and Teagle, 5 bags; Sepoy, 6½ bags; Currawa, 4½ bags per acre. Mr. W. Stephens: Gluyas, 5 bags; Nabawa, 4½ bags; Waratah, 7½ bags; Ranee, 6½ bags; Sepoy, 3½ bags; Felix (slightly rusted), 5 bags; Waratah (on stubble), 4 bags. Farm average, 6 bags. Mr. L. Stevens: Ranee, 7 bags; Waratah and Sepoy, 5 bags; Nabawa, 4 bags; Sultan, 3 bags; Noongar, 4 bags. Farm average, 5 bags. Mr. R. Bowman: Golden Return best wheat. Farm average, 6 bags. Mr. F. E. Borgas (Hon. Secretary) reported that his wheat was more or less red rusted: Federation, 3 bags; Free Gallipoli and Rance, 6 bags; Sepoy, 4 bags; Neuman's and Federation (on stubble), 1½ bags; German Wonder (on stubble), 3 bags. Farm average, 10bush.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Appila	3/3/33	9	Question Box	E. Wurst
Koolunga	23/2/33	8	Harvest Reports	I. Jones
Koolunga	23/3/33	—	Social	I. Jones
Redhill	7/3/33	9	Discussion	S. Pengilly
Appila	3/3/33	9	Report Experimental Plots, W. Lange	E. Wurst

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BLACK SPRINGS.

March 17th.—Present: Eight members.

Sheep Breeding.—The Hon. Secretary (Mr. K. Dunn) read the following paper:—"Whether the sheep owner is producing fine, medium, or strong wool, it should be his aim to see that it has pronounced quality for its type. In order to produce wools of quality, it is in the first place essential to pay strict attention to details when breeding, and exercise every care in the selection of the ram. Well bred sires are half the battle in breeding and in the production of quality wools. It is a mistake to argue that because of decreased wool returns it is not a payable proposition to continue with high grade rams. It should be realised that for an extra guinea or two a good type of sire can be obtained, and that the extra cost will amount to approximately only 6d. per head when spread over the resultant first year's dropping from that ram. The use of an unsuitable sire will probably mean the loss of 1d. or 2d. per pound for wool from the average wether or ewe when spread over a period of years. It must be remembered that by using a sire that is not of a sufficiently high standard to be the master of the flock, it is possible to produce in one mating undesirable characteristics in the flock which may take years to eradicate. Excellent flock rams are obtainable at very reasonable prices from registered breeders. When selecting rams, whether fine, medium, or strong, the same general principle applies. One of the most important points in selecting a ram is to make certain that he has the desired conformation, for without constitution a flock cannot be profitable. Therefore, rams showing any marked defects in frame, such as devil's grip, goose rump, cow hocks, ewe neck, narrow ribs, or under or over-shot jaws, a narrow face, thin papery ears, and small flat horns, should be rejected wthout giving any consideration to the fleece. To be a good sire a ram must also be alert and active; dull rams are poor workers and lack prepotency. Rams bearing thin, open wool, or possessing uneven, harsh, hempy or hairy fleeces should be avoided. The type of ewe kept will influence to a large extent the type of rams used, but breeders should select bold, vigorous rams, of good conformation, having well developed fronts, and possessing a dense, soft fleece of good length, even, bright, bulky, and showing plenty of character. Such rams will produce good wethers, as well as cut a good quality fleece that will fill the bale at a price. The aim should be to get them as near the one type as possible as regards spinning qualities, length of staple, color, density, crimp, &c."

GREENOCK (Average annual rainfall, 21.56in.).

February 13th, 1933.

Vegetable Growing.—The following paper was read by Mr. B. Hoffmann:—"The growing of vegetables can be made a pleasure as well as a distinct saving in the household bill. The garden should consist, if possible, of naturally rich soil, fairly well sheltered, and of a reasonably large size, in order to give plenty of room to the different plants. The cultivation of the soil is important; the first working should be done at least four or five weeks before planting. The ground should be worked deeply, if with the plough, not less than 8in. or 9in. If the plot is to be hand worked, the spade or fork should be used to the full depth of the blade. Farmyard manure is the best manure, used liberally with an addition of bone dust. Cabbages and cauliflowers require very rich soils, and should be planted about 2ft. 6in. by 1ft. 6in. If water is available, planting in January or February is advisable, and a dull or rainy day should be taken advantage of for transplanting. Planted in these months cabbages and cauliflowers will be fit for cutting at a time when other vegetables are scarce. Although these vegetables can be grown all the year, March and April, and September and October are generally considered the best months for planting. Small patches of peas may be sown at intervals right through winter, thus enabling the gardener to have fresh peas coming in continually. Beans should be put in late in October or November, they are easily damaged or killed by frost, and should be sheltered from cold and hot winds. Heavily manured ground is required for watermelons and sweetmelons. The land should be fallowed and worked often to reduce it to a fine tilth. Melons do best without watering. November, in this district, is the best month for planting the seeds, do not plant closer than 4ft. by 4ft. Piemelons require the same conditions, but should not be planted in the same block, or the flowers will cross fertilise, thus giving the watermelons a piemelon flovor. Perhaps the easiest of all vegetables to grow is the onion. Ashes are considered a good manure for onions. May and June is the time for transplanting. Plant in rows about 2ft. 6in. apart to facilitate working between the rows. Turnips and swedes can be grown successfully if sown in January or February, after a good rain, if sown in well-worked and manured land without artificial watering. If sown in these months they will be ready for use in May or June, and will sell remarkably well in these months. Usually from April to June are the best months to sow. Virgin soils suit turnips and swedes particularly well. Carrots and parsnips do best on land that has been thoroughly loosened, and the manure should be in the soil some time, otherwise it will tend to develop forked roots. April, May, and September are the best months for sowing these crops. Somewhat similar soil conditions, as for growing carrots and parsnips, are required for the growing of beetroot. Seed should be sown in September or October in rows 2ft. 6in. by 9in., enabling one to work thoroughly. For growing potatoes a heavy dressing of stable manure or bone dust should be given, and the soil worked very thoroughly and deeply. Planting the seed should be done in rows 2ft. 6in. by 2ft. It is not advisable to put bone dust or super in the hole with the seed, the tubers will not spread, and there

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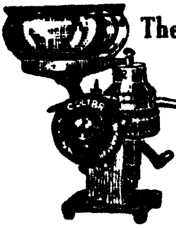

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is danger of spoiling germination, especially if the seed has been cut. Late August or September are the best months for planting this crop in the Greenock district. Up-to-Dates appear to do best. A few potatoes can be planted in January in well-worked soil, especially if they can be given two or three soakings with water. Lettuces can be grown all the year round, they require a rich soil and a lot of manure. Cucumbers require an extremely rich soil. A good plan is to sow the rows about 9in. or 10in. deep, almost fill the trench with cow, pig, or fowl manure, and cover with soil; watering can then easily be done by leaving it run in between the rows. Pumpkins marrows, turk's-heads, and trombones can be grown the same way, but the seeds should be planted about 4ft. apart each way. Keep working the soil in between while the plants are young. Do not sow seeds of these plants too early, the end of November or beginning of December is the best time. To grow tomatoes, the soil must be rich. Plant about 2ft. 6in. by 1ft. 6in., and in this district not before the middle of November if they are to be grown in the open. It is best to prune the plants and grow them on stakes. Grown in this way the fruit is better and not so liable to be burnt by the sun. In vegetable growing it is important to manure heavily and to work the soil continually to keep it loose. Make the garden large enough to warrant working with a horse and plough, and later with the horse hoe. Use the hand hoe among the plants and check weed growth. Nicotine solution is useful in controlling garden pests. Arsenate of lead mixture, left over from spraying trees, is also very good. Lime is usually considered the best for checking snails.'' (Secretary, A. Schubert.)

February 13th.—Present: 31 members.

Vegetable Growing.—The following points are taken from the discussion on a paper on the above subject read by Mr. A. Schubert (Hon. Secretary):—Well rotted manure should be used as a mulch to conserve moisture. Potatoes and tomatoes belong to the same plant family and are liable to get the same diseases. These plants are not suitable to grow in rotation on the same soil. One member had tried growing potatoes by putting the seed potatoes one inch in the ground and covering the whole piece thickly with straw. He claims to have had a good crop, the potatoes all being on the surface. Chaff dust was reported as being efficient for checking snails. Rich, open, and well drained soil is required to grow celery successfully. One member found it a good plan to allow weeds to grow with carrots until they were well established to control lucerne flea. To grow strawberries successfully it was suggested that they should be transplanted every third year and to face the morning sun.

OWEN.

February 6th.—Present: 14 members.

Harvest Reports.—Mr. W. J. Marshman supplied the following reports on the 1932-33 season and grain varieties:—*Rainfall*: The total rainfall for 1931 in this district was 16.30in., and for the year 1932, 15.85in., or difference of only 45 points between the two seasons' rainfall. One remarkable feature in regard to the two seasons' rainfall is that in 1931, 272 points fell during the first four months of the year. In 1932, for the same period, 489 points fell, nearly double the amount for the corresponding period of 1931. In 1931 from the 1st of May to the 31st day of October, inclusive—which practically covered the whole of the germinating and growing period—12.59in. were recorded. For the same period in 1932, 10.7in. fell, 252 points less rain than the previous year. Whereas 1931 did not give anything unusual in the way of summer or autumn rains, 1932 recorded 217 points more rain than 1931. *Diseases*: While red rust appeared both in 1931 and 1932, the forms of attack were vastly different. In 1931, red rust did not appear until about the beginning of hay-making in some varieties of wheat and even later in others, attacking it only about the time the grain was well formed. During the past season red rust made its appearance quite a month to five weeks earlier, reports coming to hand as early as September 15th of the appearance of rust. 1931 proved a bumper harvest, notwithstanding the presence of red rust on some varieties. 1932, while on the whole might be termed good, did not yield up to expectations. The severe late frosts combined with red rust had a most disastrous effect upon the yield. Here and there patches of take-all also took toll of the fruits of the field. 1931 was a remarkable season for gathering in the harvest, day after day warm, even temperatures enabled farmers to proceed without a break. 1932 will be long remembered for the broken time and changeable weather, the difficulties encountered, not because of rain, but of cool changes. *Wheat Varieties*: One is frequently asked what are the best varieties of wheat to grow. Hitherto, speaking broadly, the answer has been the ones that fill the greatest number of bags. This, of course, in one sense is incorrect, but the varieties that have given the most £ s. d. always will be, perhaps, the most popular varieties of wheat and the greatest factor in governing choice and selection. Of the varieties that did best this year, Sword, a Roseworthy College wheat, with an average of about 33bush. per acre, headed the list. This wheat has become very popular, and is much sought after at present. It is a prolific yielder, and also seems to be fairly resistant to disease. It was not badly affected during either of the last two seasons. Unfortunately it has three rather bad faults, the first that it is very uneven in type; secondly, it sheds its grain rather easily; and is classed as a weak flour wheat. The next best variey., *i.e.*, "wheats sown over more than 30 acres," was Nabawa. Nabawa is one of our standard wheats, and whilst in my experience it cannot be said that is a record breaker, it has been remarkably consistent. I have had less flag smut on my farm since the introduction of Nabawa. My practice is to give Nabawa precedence over other varieties in order to starve out flag smut as much as possible. Although Nabawa is not free from red rust it is able, in most instances, to withstand its ravages and to come out very well, whilst it holds its grain well. Unfortunately it is inclined to lodge, and is rather weak at the bottom of the straw, making it difficult to gather. At present it is one of the most popular wheats in the Commonwealth. Nabawa is only a medium strong flour wheat, some authorities classing it weak, especially when grown under heavy rainfall. Many of our good yielders are weak in flour. Ranee, which gave 25bush. per acre, was next in order and while it showed a fair amount of red rust on the straw, the grain was very good. This mid-season wheat is very popular in Victoria and in the Mallee enjoying a fair average rainfall, it stands up well, holds its grain, and is not difficult to thresh. It is medium height in growth. Caird appears to be a very promising variety, two local crops yielded 11 bags per acre. Bencubbin, a Western Australian wheat, has given some phenomenal yields in Western Australia. Last season it showed more than the average amount of rust, this season it was very badly attacked. Gallipoli fell back this season in yield, though the grain was very fair. Caliph, a variety that has done well for many years, was ruined with red rust and take-all. *In the Plots*: These varied from 1 to 6 acres in extent. Minflos (Minister x Florence) yielded about 30bush. per acre. This is a half-bred smut-proof wheat, and in addition should prove to be a fairly strong milling type; it is an early variety, short in the straw, and inclined to lodge. Greig's Selected, a tall, early variety, gave about 24bush. per acre. This wheat, which has done well in the early and drier north-western districts in the past, did not do so well this year. It is not recommended for this district. Quality, an early Florence type strain, grows fairly tall, is a good yielder, and withstood red rust well; grain was a good sample. Gave 8 and 9 bags per acre. Inclined to shake with rough winds, although this season it lodged somewhat and was not exposed to any winds on that account. Comeback, another strong flour wheat; one that is hard to beat anywhere in the Commonwealth, and is entered abroad for competition purposes. It is being shipped this year to the other side of the world for exhibition; unfortunately a shy yielder, returning only about 16bush. per acre. Rust did not effect it to any extent, but it is tough to thresh and has a poorly developed ear, somewhat pinched at the top. (Secretary, M. Freebairn.)

STOCKPORT (Average annual rainfall, 16.88in.).

February 28th.—Present: 12 members.

SUPERPHOSPHATES AND WHAT THEY HAVE MEANT TO AUSTRALIA.—The following paper was contributed by Mr. W. Brown, of Alma:—"The chief factor in placing Australian agriculture on a sound and lasting basis has been the introduction of superphosphates. Without this artificial manure the continued fertility of our soils would have been impossible. Before the introduction of super—towards the end of the last century—land, which, when virgin, had given excellent yields, would on further cropping give such poor returns that the crops were unprofitable. Under these conditions Australia could never have become a large wheat producer. The poverty of the soil was explained by analysis. The per cent. of both total and available phosphoric acid was found to be particularly poor. Super then began to be used, and much land thought to be cropped out once more came under profitable production. The total per cent. of phosphoric acid is not of such immediate importance as the percentage of it soluble in soil moisture. Soil moisture contains weak acids and has a solvent power approximately equal to a 1 per cent. solution of citric acid—hence the term citrate soluble. Tri-calcic phosphate is insoluble in pure water, and only slightly in soil water. With time it is gradually made available to plants. Therefore the value of a phosphate manure depends upon the percentage of phosphoric acid in it, and its solubility. Soils containing 1 per cent. of total phosphoric acid are considered rich, and when analysing same for available phosphoric acid, the lime content is of great importance, because phosphates of lime are more easily dissolved than phosphates of iron or aluminium, which are most insoluble. Analyses of Australian soil show that they have a low total percentage of phosphoric acid, and a very low percentage of it is available. Dressings of super on such soils give a very ready response, and, unlike nitrogen, there exists no natural means whereby phosphoric acid may be replaced in soils. Plant growth is governed by the law of minimum, and the growth of a plant is retarded or stopped by the deficiency or absence of one necessary plant food, even though all others may be present. From earliest times it has been known that soils that were cropped continuously lost their fertility, though the causes had yet to be learnt, and only by exhaustive test and research was it evenutally discovered that the loss in fertility was due to the depletion of phosphate in the soil. In order to restore life and vigor to soils in this condition, superphosphates were applied. These are mineral phosphates treated with sulphuric acid to render them water soluble. They are the most widely used form of phosphatic manure, and the most important of all fertilisers used in Australia. Again, super gives the best results with quick growing, short lived crops, such as root crops, as well as barley and wheat. With cereals super has a tendency to hasten ripening and to increase root growth to a greater proportion than straw. In South Australia it is customary to use no more super than the yields justify, yet it is often wise to look beyond the immediate needs of a crop, because the unused residue greatly improves the grazing qualities of a stubble, better quality grasses and clover prevail, with a strong tendency to displace weeds of all descriptions. Also, the feed is more readily appreciated by stock, and has a higher nutritive value. Dressings of super vary from ½cwt. to 2cwts. to the acre in South Australia, according to the district, also to personal experience. It is necessary to give a fresh application with each wheat crop sown, even if the previous year's crop failed to germinate. In applying super, the law of diminishing returns should strictly be observed, that is, as dressings increase their effectiveness decreases until a stage is reached at which no extra yield takes place, hence the necessity for a very rigid investigation as to what application is the best commercially.'' (Secretary, L. Klaffer.)

UPPER WAKEFIELD.

February 9th.—Present: Nine members.

The Horse on the Farm.—Mr. J. Kiely read the following paper:—''Horses are a valuable farm asset, and the best means of pulling power, both for the health of the driver and the life of the implement. At most sales this year their worth has been realised by the high prices paid for them. A good class of utility farm worker is the nuggetty medium draught, with lightly haired legs. It is a good mover and requires less feed than the heavier animals. The best means of keeping the team up to full strength is by breeding foals from the best natured and most reliable mares. If the farmer is not breeding he should always look ahead and purchase a foal or two, which will grow up with his team and be accustomed to its surroundings when broken in. A foal when weaned should be fed with the workers. Sore shoulders are often caused by an ill-fitting collar, or having it buckled too tightly at the top. A good pad can be made with a couple of thicknesses of bagging about 6in. wide to keep the collar off any sore which develops. When breaking in a young horse the shoulders should be bathed after work. A newly broken-in horse should be harnessed with a new collar measured to fit; if a good one it should last until the end of the horse's days. The farmer who is a lover of horses should not send old horses to a sale. These old horses have probably done more than their share of work and should be shot—the most humane ending to these old servants.'' (Secretary, C. F. Neumann.)

WASLEYS.

February 9h.—Present: 28 members.

Harvest Reports.—Mr. S. Helps stated that most crops were affected by ''red rust,'' but an average yield of 27bush. per acre was obtained. He considered that Nabawa was the most suitable wheat for the district, yielding 27bush. Ford yielded the highest, 29bush. per acre being obtained. Caliph suffered from ''hay-die,'' and Sword shook a little. Mr. W. R. Oliver stated that his average was 27bush per acre—Nabawa yielding approximately 33bush. per acre and Ranee (rust affected) 31bush. per acre. Malting barley sown on ploughed stubble land produced 26bush. per acre. Sword and Waratah sown on land after five successive wheat crops with 75lbs. 100 per cent. super per acre yielded respectively 26½bush. and 21bush. Mr. E. Day stated that Ford ripened and yielded well this season. Sword—although it shook a little—yielded satisfactorily. Although many crops this season were affected by hay-die and rust, Sword was unaffected. A bag he had sent to Western Australia yielded 42 bags in return; and in the Geranium district, where he had sent seed last season, he had received word that Nabawa and Gallipoli yielded 5 bush., but Sword produced 15bush. per acre. He believed that the recent strain of this wheat produced at Roseworthy Agricultural College would not shake.

Keeping Farm Accounts.—The following points are taken from an address delivered by Mr. W. H. Cowper, Secretary Roseworthy College. He said it was necessary to keep accurate record of all lines of business run on a farm to ascertain which was being run at a profit and what was a loss, so that the latter might be discarded. Books should be kept to find out correctly the assets and liabilities, and to do this the farmer should make an entry of every transaction that accurred. The books necessary to do this were, first of all, a diary divided into days to make daily entries.

(2nd) Cash book to make entry of cash coming in or going out. (3rd) A "current account" should be run at a bank. (4th) A ledger. Four rules must be followed—(1st) the farmer must give a receipt and keep a record of all money received. (2nd) Bank all receipts. (3rd) Pay all accounts by cheque, and to overcome writing out small cheques, draw a large one and keep the remainder in a "cash box." (4th) Keep record of sales and purchases for cash or money's worth. On one side of the cash book entries should be made the sales, and the other purchases; the information to be obtained from the receipt and cheque books. Sales of cereals and hay, &c., should be placed on the credit side; the stock on hand at the beginning of the year should be valued, and if the sales or purchases showed a profit, these should also be placed on the credit side. Depreciation must be estimated on machinery and written off on the profit and loss account. In a lease, 20 per cent. depreciation must be written off every year, also the salary of the proprietor. Any implement purchased must be deducted from the balance-sheet; all personal expenses must be eliminated from profit and loss account and should be taken off capital, the balance obtained will be the net profit. (Secretary, C. Currie.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Truro	20/2/33	17	Annual Meeting	L. Davis
Brinkworth	6/3/33	7	Address—R. Booth	H. Ottens
Buchanan	10/3/33	16	Address—W. C. Johnston	L. Bell, Marrabel
Wasleys	9/3/33	23	Conference Report	C. Currie
Snowtown	13/3/33	11	Address—H. B. Barlow	A. Hocking
Light's Pass	13/3/33	25	"Breeding Horses," J. Baum	C. Verrall
Rosedale	6/3/33	12	Auburn Conference Report	S. Sincock
Upper Wakefield	9/3/33	9	Auburn Conference Report	C. Neumann, Halbury

YORKE PENINSULA DISTRICT.

BOOR'S PLAINS (Average annual rainfall, 15.61 in.).

March 2nd.—Present: 12 members.

CARE AND ECONOMY ON THE FARM.—The following paper was contributed by Mr. C. Rodda:—"Farming at present is a non-payable proposition, and with primary products returning only half as much as they did several years ago, and the cost of all the farmer's requirements and his taxes practically the same, the farmer has little hope of making ends meet. This State depends almost wholly on its primary products for its wealth, therefore the farmer must economise as much as possible if he is going to keep himself and the State out of bankruptcy. The farmer is often at a loss to know just where economy begins or ends, and whether money spent for extra labor or plant is really economy or extravagance. Economy lies not so much in rigidly curtailing all expenditure as in spending wisely and putting money into farming operations that will show more profit. Many farmers through lack of cash cannot economise to the greatest extent during these times, because they are unable to purchase materials or plant that are necessary to keep production up to a maximum. It is very puzzling to know what is the most economical dressing of superphosphate to use, most farmers having decreased the amount during the last two years, but according to official tests in various localities it would have been more economical not to have done so if they could have purchased the extra super. Oats and barley generally do not need heavy dressings of super, and for oat or pasture crops following wheat and sown early it would be more economical to put a heavier dressing on the wheat crop and less on the oat or pasture crop. By adopting a rotation, such as wheat, oats (for hay or pasture), wheat, fallow, and wheat, barley, fallow, more of the farm is producing each year, whereas with wheat and fallow cropping, one-half of the farm is unproductive and has not the added fertility which oats and barley give the land. Oats should be sown for hay, for besides being grown cheaply on stubble land, this crop benefits the land, and the farmer does not have to cut into his fallow crop for hay. Every farmer should have at least two or three years' supply of fodder on hand during good years, and haystacks should have a mouse-proof fence which can be erected by the farmer for a reasonable sum. A large stack of cocky chaff put inside an 8ft. to 12ft. wire-netting fence with a good straw covering will prove a valuable standby during a lean period. Do not overstock; it is more profitable to have less sheep and keep them in good condition for producing good fleeces and rearing a big percentage of lambs than try to keep more when the feed supply will not allow them to be always kept in good condition. Farmers should possess enough blacksmithing tools to carry out at least minor repairs, and many will find with a little practice that more important jobs can be done, and will save time and expense travelling to a blacksmith. When buying tools, harness, &c., it will generally be more economical to pay extra for an article of good quality, which will greatly outlast the inferior one and give better service. Much of the harness repair bill can be saved by keeping harness well oiled with neatsfoot oil, which is also good for the handles of forks, picks, shovels, &c. Oil drained from car and tractor sumps can be used for many purposes, such as oiling timber of fowlhouses to keep down tick and lice, and for lubricating ploughs and cultivators if the oil is not too thin. Shares should be sharpened or discarded if they will not do a reasonably good job, and reversible 8in. scarifier shares, after being used both sides, can be turned into a narrow share with two more wearing ends. All implements should be kept in good working order, and machinery, such as harvesters, binder, wagon, and combine, kept under cover when not in use. If the farmer cannot afford a galvanized iron shed, then he can build a straw shed with little expense. Loose and blunt harrows cannot do first-class work, and the cost of repairing them would probably be saved many times over in one year's work. Harvesters, &c., should be put in order during slack periods and save valuable time when they are in the field. Much trouble and many breakages can be saved by looking over machines regularly and keeping bolts tight and adjusting where necessary, taking special care to keep a new machine screwed up during its first season's work. Use good oil and plenty of it, the machine will last much longer and give better service. Also drain the crank case of the car and tractor regularly. Insurance in many cases is good business, but care in feeding and looking after stock and making good firebreaks, &c., is good insurance, which should be the practice of all farmers. Every farmer should aim at improving the quality of his stock, whether it be horses, cattle, sheep, or pigs, and the most economical way is to mate good pure-bred sires with the best breeders. A good animal costs no more to feed, produces more profit, commands a better price if being sold than an inferior one. Try to work with a system, and keep up with seasonable jobs, especially field work. Make an extra effort to get the seed in at the right time, which may mean extra bushels to the acre. The fallowing can be done early and allow more time for subsequent workings; early fallow is always recognised as better than late. Finally, all farmers should be members of the Agricultural Bureau, and by an interchange of ideas, methods, and tests help themselves and their fellow farmers.'' (Secretary, C. Chynoweth.)

BRENTWOOD (Average annual rainfall, 15.45in.).

February 9th.—Present: 11 members.

HARVEST REPORT.—The following was presented by Mr. J. Boundy:—''The season was an early one, and rain falling early gave weeds a chance to grow. One of the difficulties that arose during the later seeding was the hard task to destroy weeds which had a firm hold. Germination was excellent for both wheat and barley. During the whole growing period there was no lack of rain; at periods there was too much moisture, rendering the growth soft and sappy. During September and October weather conditions were unfavorable; instead of bright, sunny days, exceptionally cold, cloudy weather was experienced. Growth of crops was wonderful, and there was promise of a bountiful harvest. Early in November three sharp frosts were recorded. Crops were affected considerably with red rust. In some cases crops were ruined with takeall and haydie, especially on stony soils; the wheat yield being affected by at least 30 per cent. Varieties of wheat which could not withstand the severe conditions which prevailed were Sultan, Early Gluyas, King's White, African, and South African. The wheat which proved most effective against rust was Ford, Currawa following closely. Nabawa—though not yielding so well on the whole—was fairly good. Ranee—a wheat grown largely in the district—put up a creditable record, both for yield and quality. Waratah—an early variety—is in favor with several farmers. The sample of Gluford was better than usual. Sword yielded well. Dan—a new wheat to the district—did fairly well. Gallipoli is still a useful wheat to grow. The yield—notwithstanding disease—was fairly satisfactory, the average for the district being about 14bush. to 15bush. to the acre. Barley crops were fairly good, the quality of the grain being more even than during the past year or two, and on the whole—from a maltster's viewpoint—more satisfactory. From experiments carried out in this district with various varieties of barley, Prior stands out distinctly as the best variety. Average yield of barley from 6 to 7 bags to the acre. Oats grown chiefly for hay made good growth, in some instances they were too heavy, the result being tangled crops. These crops would cut from 1½ to 2½ tons to the acre. Variety mostly grown was Mulga. The average rainfall for the year was 19.76in. The quantity of barley that will be delivered at Port Minlacowie this season will be about 68,000 bags. The quantity of wheat about 47,000 bags. The harvest was fairly satisfactory, but prices are the disturbing factor which farmers have to face. Crop competitions were again held on Southern Yorke Peninsula, showing the keen interest taken by farmers in this friendly rivalry.'' (Secretary, G. Carmichael.)

KILKERRAN.

March 14th.—Present: Nine members.

Side Lines Suitable for Present Conditions.—Mr. A. Sawade contributed the following paper:—''Prices of primary products are very much lower than they were six or seven years ago. At that time most farmers in the Peninsula were cereal growers; they concentrated mainly on wheat, and all their time and means were put into this operation. Generally speaking, they met with a fair measure of success and they were able to carry on, thanks to high prices and fairly good yields. To-day, however, the price for wheat and barley is barely a third of what it then was, the farmer's income is greatly reduced, but expenses have not fallen and consequently it is difficult to make ends meet. There are four lines, which appear to be suitable for existing conditions, sheep, cows, pigs, and fowls. To make the most out of any of these lines, taking into consideration the conditions as they exist on most farms in the district, the best plan is to run all four of them in conjunction, one with the other. By running a number of cows the milk can be utilised by being fed to pigs, and thus save a considerable amount of grain ration. Start off on a rather limited scale and gradually increase, chiefly because this work is an entirely new activity and mistakes will not be so costly. Even with the present low price of butter fat, a bushel of oats fed to milch cows is worth about 2s., and a bushel of barley fed to pigs about 3s. 6d. Fowls, too, though eggs are cheap, bring in a little profit, and a bushel of wheat fed to fowls brings in about the equivalent of 3s. 6d., presuming that the fowls have free range. As to sheep, it is doubtful if it is profitable to have a large flock on farms in this district. I recommend a small flock to supply ration sheep for the farm, and the flock would be large enough to do the scavenging on fallows on the average farm of the district. The breed for any of these lines is immaterial so long as the right type of the breed is obtained. (Secretary, E. Koch.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
South Kilkerran	7/2/33	8	Harvest Reports	R. Hasting
Paskeville	7/3/33	9	Paper from *Journal*	J. Prouse
Kilkerran	14/2/33	9	Question Box	E. Koch
Weavers	6/3/33	12	Harvest Reports	H. Cornish, Stansbury

WESTERN DISTRICT.

GOODE (Average annual rainfall, 9.95in.).

February 15th.—Present: 14 members.

Discussing the subject ''Improved Agricultural Practices,'' Mr. H. Gaden strongly advocated the use of more super, and advised farmers to grow more oats, which, besides being one of the best fodders for horses, also helped to check takeall. Members thought that sheep should be on every farm. Mr. Gaden said that about 200 sheep would be sufficient for a farm of about 1,500 acres in this district. Mr. B. O. Klau thought that many more sheep could be carried if farmers subdivided their paddocks. The meeting thought that an agricultural exhibit at the next Agricultural Congress at Ceduna would be interesting and instructive. (Secretary, B. Linke.)

GREEN PATCH (Average annual rainfall, 26.56in.).

February 9th.—Present: Eight members.

Things that do not Pay the Farmer.—Mr. H. Schwerdt read the following paper:—''It does not pay to leave farm implements, harness, and other perishable property in the sun, rain, heat and cold, and to keep on paying bills for repairs and renewals through the things being out of order when they are required; to purchase commercial fertilisers and allow tons of stable manure to remain idle in the yards and have all its valuable properties leached out by rains; to put off the preparation of land for a few weeks because the ploughs or harrows need repairing, or the teams are tired or worn out; to turn stock out in winter because there is no work for them to do—always have enough work for animals to keep them out of mischief and pay for a good day's feed, and see that they get it. To sit by a fire in winter while cattle shiver in the fence corners, and the pigs squeal in their efforts to get under each other for warmth; to lie in the shade during summer while cows and other stock are enclosed in an open paddock with no provision made for shelter from the heat; to cover the land with grain crops and wild oats and refrain from keeping sheep, horses, and cows because there is no feed for them; to pay close attention to the horses, cattle, and pigs while working all the spirit out of the women folk and children; to sell the best of the produce of the farm to the town people and consume at home only that of an inferior quality; to neglect to provide the wholesome comforts of life for the family; to keep mongrel and nondescript stock, which fetch nothing if put up for sale, whilst there is always a big demand for really good animals which cost no more to breed and keep; to keep a lot of useless dogs about the place; to neglect the cultivation of vegetables and fruit; to use old-fashioned implements; to allow stock to lose condition because grass runs low—if you cannot feed properly, sell. Finally, it does not pay to be a non-member of the Bureau. If one has a wide knowledge of farming, it behoves him to attend meetings and impart such knowledge to those not so gifted.'' (Secretary, C. Whillas, Port Lincoln.)

LAURA BAY.

January 10th.—Present: Eight members.

Members discussed general farm operations. Mr. W. Edson reported that Late Gluyas had been badly attacked by flag smut.

Rabbit Destruction.—Twelve members attended the meeting held on February 13th. It was stated that rabbits were very numerous, and concerted action would be necessary to keep them under control before early rains fell. Mr. E. Barnett advised digging in the burrows. Mr. F. Edson had used a blacksmiths' blower for forcing fumes down the burrows. He also had had excellent results with apples and jam mixed with strychnine. Mr. J. Blumson said traps were necessary to catch the stray rabbits. (Secretary, W. Edson.)

PYGERY.

March 7th.—Present: Seven members.

Wheat Growing in Australia.—Mr. A. Riggall read the following paper:—''It is not surprising that as soon as possible after the landing of the first settlers in Australia an attempt was made to grow wheat. At the head of Farm Cove, on land that is now a part of the Sydney Botanical Gardens, Governor Phillip started a farm of about 10 acres under the management of Edward Dods, one of the few among the first settlers who knew anything at all about agriculture. On account of the rocky nature of the land this farm was not a very great success. Before the first year had elapsed another piece of land was selected as a farm site near the head of the Paramatta River. At Rose Hill a small fort was built and a detachment of soldiers stationed there to protect the convicts who were employed to cultivate the ground. Before the end of 1790, about 200 acres, partly within what is now Paramatta Park and the rest of it within the township of Paramatta, had been cleared and cultivated. There the first farmer working on his own account and not as a servant of the Government had his grant. This was James Ruse, a Cornishman, who had been convicted and sent to Port Jackson with the first fleet. His grant was known as Experiment Farm. After that farming areas were opened up in New South Wales at Prospect, Subiaco, Carlingford, Toongabbie, and on the Liberty Plains, and in 1794 in the Windsor district. Very soon the country around Windsor and Richmond became the most important agricultural district in Australia, and there, until the crossing of the Blue Mountains, the greater part of Australian wheat was grown. By 1816 wheat was doing well around Bathurst. In his report Governor Macquarie says 'The wheat is of a superior quality to that generally grown on the eastern side of the Blue Mountains.' The expense of carting it the long distance to the seaboard and the greater profits to be made from wool held back wheat farming in the western districts of New South Wales for many years. After the gold discoveries it became clear that the wheat areas were moving from the coast districts to the tablelands, and by 1880 the greater part of the New South Wales wheat was being grown there. Already, however, there were signs that the western slopes and Riverina were destined to become the great wheat country of the future. The existence of large sheep stations and the absence of railways were the chief causes of this late development. Gradually, however, the great sheep stations were broken up and the railway extended, so that since the beginning of this century the western slopes and the Riverina have been the most important wheat areas of New South Wales. Although they were not aware of it, the first settlers in South Australia had placed themselves just where the Australian wheat belt comes to the coast. Rich volcanic soil and a suitable climate gave the settlers in this State advantages over the settlers in the other colonies. Our State was fortunate, also, in that she received amongst her early colonists several shipments of German Lutherans. In 1838 and 1839 about 500 of these thrifty and industrious farmers reached our State and were soon hard at work. They set an example of careful, painstaking husbandry, which affected South Australian agriculture for many years. From the gold era until 1880, South Australia was growing more wheat than any Australian colony. Then Victoria began to catch up, but it was not until 1890 that South Australia was definitely beaten. Since 1914 New South Wales has been the greatest wheat State in the Commonwealth. Western Australia takes fourth place in wheat production, but a great deal of her wheat areas is not fully developed, and it is quite likely that Western Australia will one day be among the first of the States in wheat production.'' (Secretary, A. Day.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Elbow Hill	8/2/33	15	Address—W. J. Spafford	W. Cooper
Kapinnie	25/2/33	—	Annual Meeting	A. Giles
Kyancutta	7/3/33	15	Discussion	J. Dyke
Miltalie	25/2/33	12	"World Finance," Rev. H. White	G. Smith
Goode	15/3/33	17	"Queensland Farming," L. Bowman	B. Linke

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

OVERLAND CORNER (Average annual rainfall, 10.41in.).
February 8th.—Present: 12 members.

HARVEST REPORTS.—Mr. H. A. Loffler reported Waratah, 14½bush.; Sultan, 15bush.; Gluyas, 15bush.—all on fallow sown with 35lbs. seed and 45lbs. super per acre. 375 acres of fallow averaged 15bush. per acre. Gluyas drilled in on stubble ground, 9½bush.; oats on stubble with 35lbs. super, 21bush. per acre Mr. E. Atkinson: Fallow—Sultan, 10bush.; Waratah, 10bush.; Faun, 12bush.; and 1¾ acres of Aussie did well. Mr. Atkinson advised members to try this variety. Stubble ground yielded about 8bush. per acre, and oats, broadcast, 12bush. per acre. Mr. A. Robertson: Wheat on stubble, 6-8bush. Fallow—Gluyas, 16½bush.; Nabawa, 12bush.; Gluyas, 12bush. Mr. T. Atkinson: New ground, 9bush.; stubble, 9bush. Mr. J. Loffler: Fallow—Nabawa, 10½bush.; Gallipoli, 13 bush.; Sepoy, 15bush.; Faun, 12bush. Stubble—Gallipoli, 12½bush.; Sepoy, 11bush. and 13bush. (Secretary, H. Loffler.)

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Moorlands	21/2/33	8	Address—R. L. Griffiths .	R. Wilmshurst
Yurgo	13/3/33	8	Annual Meeting	H. Mackenzie
Netherton	8/3/33	7	Discussion	C. Wilkin
Overland Corner	8/3/33	11	Question box	H. Loffler

SOUTH AND HILLS DISTRICT

ADELAIDE (Average annual rainfall, 21.10in.).
January 12th.—Present: 15 members.

CATTLE COMPENSATION.—The Hon. Secretary (Mr. J. Hewland) read the following paper:—There is undoubtedly a real need for the establishment in South Australia of a cattle compensation fund similar to the one in Victoria. This need arises principally from the fact that from time to time cattle are condemned by a Government Stock Inspector to be slaughtered because they are suffering from disease, *e.g.*, pleuro pneumonia or tuberculosis. As there is no fund out of which compensation can be paid to the owner, he suffers a heavy loss. The order to slaughter is issued in the interests of other cattle owners whose animals may become infected, and also in the interest of public health, for which reasons it is only just that the Government should take some action to assist those who are called upon to suffer loss. It is not meant by this that the Government should be asked to find the money to compensate owners of condemned cattle, but it is contended that the Government should provide the necessary machinery for enabling the owners to provide their own insurance. The scheme proposed is as follows:—The Commissioner of Stamps would be authorised to have printed special cattle compensation fund duty stamps of various denominations, and whenever a beast was sold the owner would have to place one of these stamps on the receipt to the value of 1d. for each pound received for the animal, and the proceeds of these stamps would be placed to the credit of the Cattle Compensation Fund. The maximum amount that would be deducted for any one animal sold would be twenty-five pence (2s. 1d.).

The following are some of the more important clauses in the Victorian Act, and they will explain themselves:—

I. Subject to this Act compensation shall be payable under this Act in the cases and to the extent and subject to the conditions hereinafter provided—

(*a*) to the owner of any cattle destroyed by order of any inspector of stock because such cattle are suffering from or suspected as suffering from disease; or

(*b*) to the owner of any carcass or portion of a carcass condemned under the Health or Food and Drugs Act at any abattoir by a meat inspector as unfit for human consumption because of disease.

II. Subject to this Act the amount of compensation payable pursuant to this Act in respect of cattle ordered to be destroyed because such cattle are suffering from or suspected of suffering from disease shall be—

(*a*) if after destruction such cattle are found to be free from disease—the market value (subject to such deductions as are hereinafter specified) of such cattle; and

(*b*) if after destruction such cattle are found to be diseased—seven-eighths of the market value (subject to such deductions as are hereinafter specified) of such cattle.

Provided that in no case shall the market value of one head of any cattle be for the purposes of this Act deemed to be more than £25.

(*c*) Subject to this Act the amount of compensation payable pursuant to this Act in respect of any diseased carcass or portion of a diseased carcass condemned as unfit for human consumption because of disease shall be in accordance with the prescribed scale.

III. (*a*) The value of any cattle so destroyed or of any carcass or portion thereof so condemned shall be determined by agreement between the owner thereof and the inspector or other officer under whose authority such cattle were destroyed or such carcass or portion thereof was condemned; and in default of such agreement the value shall be determined by some competent and impartial person nominated for the purpose by the Minister, and the determination of such person shall be final and conclusive.

(*b*) The residual value of any cattle so destroyed or of any carcass or portion thereof so condemned shall be determined in the like manner.

The Fund and Stamp Duties.—Every owner of cattle or his agent shall upon the sale thereof whether payment of the purchase money is or is not made in full at the time of the sale or is to be made by instalments or is otherwise deferred—

(*a*) write out or cause to be written out a statement setting forth the number of cattle so sold, the amount of the purchase money in respect of each head of cattle, and the date of the sale thereof;

(*b*) affix to the said statement cattle duty stamps to the amount of the duty payable under this Act and cancel such stamps; and

(*c*) give or transmit the said statement to the purchaser within seven days.

CONFERENCE.

A conference was held some months ago in the office of the Secretary to the Minister of Agriculture for the purpose of discussing the proposal to approach Parliament with a request to pass a Cattle Compensation Act for this State. At this Conference were representatives of the Stock Owners' Association, the Stud Cattle Breeders' Association, the Amalgamated Dairymen's Council, and the Metropolitan Dairymen's Association. Mr. Summers (Secretary Minister of Agriculture) presided over the Conference, and the Chief Stock Inspector, Mr. Loxton, was present. As a result of the Conference a Committee was set up to go further into the matter. At the Conference it was suggested that in the first instance it would be wise to limit the scheme either to the whole State—except the Western District—and the area north of a line from Port Augusta to Carrieton or to the Central and Lower North Statistical Districts and to three miles on the eastern side of the Murray, including also the hundreds of Malcolm, Baker, and

Bonney. In the former area there are approximately 115,000 dairy cattle of the age of 1 year and upwards, and in the latter area about 86,000 dairy cattle and heifers. It was also proposed that to inaugurate the fund, every dairy cattle owner should pay into it at the outset not less than 1s. per head for every head of cattle he owned, and if he valued any animal at more than £12 then he should pay into the fund an extra penny for each additional pound in value up to a limit of 25d. in all. Any cattle owner who has had the unfortunate experience of having cattle destroyed on the order of a stock inspector will agree that the existence of a Compensation Fund such as is now advocated would have been a boon to him. The sooner an Act is passed establishing such a fund the better it will be for cattle owners, and the writer would urge all owners to pull together and work for the passing of an Act.

Cattle Compensation Fund.—The maximum amount that would be deducted for any one animal would be 25d. When an animal was condemned and slaughtered the owner would be paid out of the fund. The amount payable pursuant to the Act in respect of cattle ordered to be destroyed because such cattle are suffering from or suspected of suffering from disease would be—

(1) If after destruction such cattle are found to be free from disease—the market value of such cattle.

(2) If after destruction such cattle are found to be diseased—seven-eighths of the market value of such cattle.

Provided that in no case shall the market value of one head of any cattle be, for the purposes of this Act, deemed to be more than £25.

March 9th.—Present: 16 members.

THE ESTABLISHMENT OF A BOARD TO CONTROL THE MILK TRADE WITHIN THE METROPOLITAN AREA.—Mr. R. Mortimer read the following paper:—"The proposed milk board is a topic of all absorbing interest wherever dairymen gather, and while the majority of dairymen favor the creation of a board, it is realised that there is a small minority who are opposed to any further legislation in regard to the milk trade, and also to any form of control other than that already in force. It will be readily admitted that the trade is in a deplorable condition through the number of shops, also the hundreds of men and boys selling from bicycles, &c., all of whom sell at prices which are uneconomic and below those at which anyone, working full time and delivering a good article, can possibly meet his obligations. While those who oppose the creation of a board of control agree in every instance with the foregoing remarks, they are destitute of any ideas concerning any alternative scheme to put business upon a satisfactory basis. And, while agreeing that something must be done, seem to be content to drift along in the hope that something will turn up. Some object to the proposed board on the ground that country interests would be predominant and would succeed in forcing the metropolitan dairyman out of the city and suburbs. Such a thing has never been done, even in Wellington, New Zealand, where they have a municipal scheme, the local dairyman is still on his original holding, and no attempt has ever been made to dislodge him. Other objectors say that they have never known a board to do anyone any good. No one will dispute that wage boards have been extremely beneficial to members of trades unions. These boards have been the means of bringing about higher and stabilised rates of pay, limited hours of labor, and conditions generally have improved for those people who are covered by the awards which from time to time have been made by those constituting the various boards. The people who are protected by the various awards were at one time unorganised and without representation. This state of affairs reflects the conditions which the dairymen has to meet to-day.

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TELEPHONE: CENTRAL 4855 and 4856.

Dairymen to-day, and primary producers generally, are, with few exceptions, in much the same position as were tradesmen in days gone by. We have to sell our produce at whatever price we can obtain, irrespective of whether the price obtained will bring us in a fair return or otherwise. We are also subject, under the present form of control, to competition from all who care to compete with us, and as many of these people sell at impossible prices, we are in much the same position as were the tradesmen before the law said a man working at certain specified callings must be paid at specified rates. Note how this affects the milk trades. Many dairymen to-day are compelled to pay a fixed rate for labor, and at the same time are subject to competition from people who pay almost nothing in the way of wages. Another reason why I am in favor of a milk board of control is that with the number of vendors operating in Adelaide to-day—about 1,350—it is impossible for the limited number of inspectors to properly police the activities of those concerned in the distribution of milk within the metropolitan area. These officers have, in addition, many other duties to perform in administering the Food and Drugs Act throughout the city and suburbs. Markets, hotels, all shops, and factories where foodstuffs are produced or sold, are subject to inspection by these officers. This state of affairs means one of two things, either more inspectors will be required or a very inadequate inspection by existing inspectors is all that can be expected. The latter alternative, in view of the fact that it is so necessary to maintain a pure milk supply, would be most undesirable from a health point of view. Objection has also been raised to price fixing. Those with whom I have sat in conference are not looking for any extravagant returns from their businesses, but are asking only for such prices as would enable a man, by dint of hard work and honest trading to secure at least enough to give a living wage. The price of almost every article required by the producer has something added to it in the form of duties, taxes, &c. As primary producers are buying in a highly protected market and paying inflated prices, the only solution of our present difficulties is to have a measured protection for our own products, in so far as they are used in our home markets.''

DEHORNING OF CATTLE AND BULLS.—Mr. J. Hudd read the following paper:—''Cattle running in their wild state were provided with strong, sharp horns to protect themselves and their offspring; when they became domesticated man provided that protection against other wild beasts. To-day there are many breeds of domestic cattle, but practically all have still the weapons which Nature provided, and these are used mainly to-day as a means of aggression in a herd. There is hardly a herd of cattle in which there are bosses, the result is a constant fear and dread one of another in the herd, and it is rather a frequent happening to bring in the cows and find one injured with the horns of another animal. These can be noticed, but one does not see the body bruises of the cows. A contented herd will give more milk, but a herd with their horns on are never contented. Dehorning certainly robs some breeds of their individuality, but to-day cows are kept more for what they will put into a bucket than for showy appearances. In America, and more so in Canada, nearly all herds are dehorned. They claim it gives greater production and more contentment. The simplest way is to start on the calves; if a caustic potash pencil is rubbed on the spot where the horns are to come at any time during the fourth to tenth day the horns will never grow. This prevents the two little buttons, which are to become horns, from setting to the skull. With mature cattle there are two methods—either doing it with a dehorning instrument or with a fine-tooth saw. In older animals, and especially bulls, the saw is preferable, because it has not the tendency to crack the skull. In the wild state the bull is the natural head and protector of the herd; under domestication he is not to be trusted. Numerous prominent studmasters have met their death because of the unreliable tempers of the bull. Others, again, owe their lives to their foresight in dehorning their cattle. Men, as they get up in years, become very hard to convince that any change is for the better, and it is only the fixed prejudice of some of the older studmasters that prevents compulsory dehorning of all bulls at the age of 12 months. The Royal Agricultural Society could give a very valuable lead in this matter by instructing the men whom they asked to act as judges to refrain from giving or allowing points for a bull's horns. The younger generation must be educated to understand that horns are a detriment to dairy cattle. The S.P.C.A. should take up the case for the dehorning of cattle to prevent cattle from being cruel to one another. Finally, the man who plays for safety with regard to his stud bulls would not be penalised, as he very often is to-day, for taking natural safety measures.'' (Secretary, M. Hewland.)

FRAYVILLE.

February 7th.—Present: 10 members.

HARVEST REPORTS.—Mr. V. Dohnt, who won the local Crop Competition, furnished the following report:—Nobawa, 31bush.; Bena and Gallipoli, 24bush.; Currawa, 15bush.; each sown at the rate of 57lbs. seed and 90lbs. 48 per cent. super per acre.

Mr. N. Wachtel's best crop was Nabawa, 32bush. Other varieties yielded as follows:—Bena, 20bush.; Ranee, 24bush.; Gallipoli, 24bush. Rate of seeding, 67lbs. sown with 90lbs. 45 per cent. super. Mr. B. Lindner reported:—Nabawa, 27bush. and 26bush.; Gallipoli, 24bush.; Bena, 21bush. and 18 bush.; Ranee, 22bush.; Crossbred, 13bush. Average rate of seeding, 70lbs. with 90lbs. 45 per cent. super. (Secretary, V. Eichler.)

INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

February 16th.—Present: 10 members.

Lessons from 1932.—Mr. W. Mayfield read the following paper:—"Two things have been brought home to the man on the land during the past year: (1) The fall in values in the staple product—wool—with the resultant diminished income and the necessity for the explorations of fresh avenues to build up such deficiency; and (2) the changed nature of the pastures, necessitating different methods of working. Increased production can only be brought about by careful and efficient management and the selection of well bred stock, with liberal annual applications of super. Conditions obtaining in this district enable one to carry on a mixed farm, which is more payable than the holding which has an income from one source only. The mixed farm is one which handles most sidelines, including dairying, pig raising, poultry, sheep, etc., which can be utilised to derive income. One feature of 1932 which cannot be overlooked is the seriousness of the rabbit pest, largely brought about by the low prices for skins during last winter. This pest can only be dealt with successfully by co-operative work and landholders destroying them in a stipulated period. Cyanide gas has proved very effective. This poison is used by placing it in every fourth hole in the warren and blocking up all burrows. This can be repeated in the course of a fortnight. The next lesson is the prevention of milk fever which has been prevalent in the past two years. The high producing cow is more subject than others, and prevention is better than cure. The cow should be kept under close observation prior to calving and grazed in a paddock which does not contain too much pasture, or her food should be reduced. After calving, the cow can be kept under the same conditions for a few days, but she can be given a little clover hay until she becomes quite settled. The cows should come in early in April or the latter end of March. With the advent of clover hay one can overcome the food problem. Possibly the cows will give less than when coming in in spring, but returns will more than compensate for low results. Secondly, this plan will mean a marked improvement in the welfare of the rising herd. The calves can be fed from the skim milk, which is the best food for this purpose. Keep them on the bucket until three months old, then turn them out whilst the feed is green. The calves will then become accustomed to foraging for themselves prior to the summer months. The well-cared for calf will prove a better cow than a stunted calf which has been turned off the bucket in mid-summer, which will be the case if the cows come in in spring. With the advent of super it is possible to overcome the problem of feed in early winter. A large stack of clover hay can be saved by closing up a paddock during the growing stage. A silage stack is recommended in preference to meadow hay for cows on the former feed. The cows will milk better and the quality of the milk will be improved, besides keeping the cows healthy. Do not have the silage stack too big in circumference; height is necessary to success, with the help of plenty of weight." Mr. Mayfield drew attention to the inconvenience of wool sheds, the lack of room on the shed floor, and insufficient grating. "The average shed in this district has about three shearers, and generally grating to hold 120 sheep under cover from rain. Consequently it means one day shearing and then a break possibly for several days or a week. The shearing award was made out on the basis of 490 sheep per week, which gives a result of 27s. 6d. per 100. This is satisfactory in drier areas, where the delays are not caused by weather conditions. Local shearers do not average that figure. If they get three full shearing days, shearing 50 sheep per day, it means a tally of 150 for the week. At 27s. 6d. per 100 for 490 sheep per week equals £6 17s. 6d., compared to the southern districts of 150 sheep per week equals £2 1s. 3d. These results lead one to suggest that the award should only apply in northern districts where big scores are put up by machine men. The low score made by the blade man and the difficulties under which he works in the south need revising. It may be argued that if a higher price per pound for wool was paid it would be possible to improve buildings, but on 10,000lbs. of wool one would receive a ¼d. per pound more by giving it more attention, and better facilities in getting it up for market by having a good shed would result in an income of £10 8s., a return of very good interest on a building of £150."

MOUNT BARKER (Average annual rainfall, 31.79in.).

February 20th.

Mr. C. H. Beaumont (District Horticultural Instructor) delivered an address, "Onion Culture."

Reference was made to the valuable assistance which Mr. Beaumont had rendered to growers in the Hills Districts during his long association with the Department of Agriculture, and on the eve of his retirement from the Civil Service it was decided, on the motion of Mr. J. E. Smith, seconded by Mr. E. Mappley, to place on record the appreciation of members of the Mount Barker Branch of the good work performed by Mr. Beaumont. (Secretary, P. Wise.)

Milang Field Day.—Inspecting a pure-bred Jersey belonging to Mr. A. Kelly.

Clover Hay Stack of 150 tons on Mr. H. Pearson's Farm, Milang.

POTATO COMPETITION AT MOUNT COMPASS.

Mr. A. S. Kidman (Chairman, Mount Compass Branch) has supplied the details of a Junior Potato-growing Competition which was conducted by the Branch last year. The competitors were school boys, who planted the seed, and the weighing of the seed as well as the crop was carried out under the supervision of members of the Branch.

The competition was won by Linton Jacobs, seven years of age, who secured the remarkable return of 217lbs. of potatoes from 1lb. of seed. The seed consisted of six potatoes (Carmen No. II.) cut into 50 pieces and planted by the competitor without any assistance in the first week of November, 1932, on a plot 8yds. by 6yds. of peaty soil, and watered once. The land had been in use for 25 years, although it has not been cropped for three years prior to the competition. The following fertilisers were applied:—1 kerosene tinful each of Abattoirs blood and bone No. 1 manure and superphosphate (45 per cent.), one-third tin of sulphate of ammonia, and three bags fowl manure.

Mr. Kidman states that the boys showed a very keen interest in the competition, and that the winner has received the congratulations of the Branch on the highly commendable results he obtained.

The following table shows the list of competitors and the returns from their respective plots:—

	Potatoes Harvested. Lbs.		Potatoes Harvested. Lbs.
L. Jacobs	217	R. Williamson	98
N. Anderson	209½	K. Peters	89
D. McKinlay	143	T. Garden	77
N. Jacobs	128	S. Hails	56
A. Stone	117½	A. McClean	39
B. Peters	114	S. Miller	34
R. Richardson	106	R. Coles	38

Mount Compass Junior Potato Growing Competition. (Left) Winner—Linton Jacobs (Right) Second—Norman Anderson.

Other Reports Received.

Branch.	Date of Meeting.	Members Present.	Subject.	Secretary.
Monarto South	18/2/33	17	Paper—J. Hartmann	C. Altmann
Hope Forest	6/3/33	—	Address—R. C. Scott	E. Muldoon
McLaren Flat	16/2/33	22	Address—G. Quinn	P. Wait
Brinkley	8/3/33	14	"Barley," S. McCauley	R. Pearson
Mt. Compass	2/3/33	100	Lecture—Vacuum Oil Co.	C. Verco
Langhorne's Ck.	8/3/33	9	"Limiting Production," S. Brown	P. Nurse
Frayville	7/3/33	17	"Tractor Farming," L. Wachtel	V. Eichler
Macclesfield	16/3/33	15	Address—P. Wise	H. Ross
Tweedvale	16/2/33	19	Question Box	B. Schapel
Mt. Pleasant	10/3/33	5	Discussion	D. Smith
Shoal Bay	14/3/33	7	Discussion	E. Bell
Currency Creek.	13/3/33	9	"Sheep Dipping," D. Gordon	D. Jeff Gordon
Currency Creek.	13/2/33	8	"Wheat Marketing," E. Skewes	D. Jeff Gordon
Cherry Gardens.	11/3/33	9	"Motor Trip to Victoria," A. and I. Stone	A. Stone

CROWN LANDS.

LANDS TO BE OFFERED SHORTLY.

Lands to be offered in the Hundreds of ALLEN, BOWHILL, BRIGHT, ETTRICK, FISHER, HOLDER, KADINA, KEKWICK, MILNE, NOARLUNGA, PEEBINGA, POOGINOOK, and TICKERA.

When offered full particulars will be published in the *Government Gazette*, and plans and detail may be obtained on application to the Director of Lands, Box 293A, Adelaide.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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All communications to be addressed:
"The Editor, Journal of Agriculture, Victoria Square, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

River Murray, at Berri, Thursday, June 15th. (Secretary, Mr. E. J. R. Johnson.)

Eyre's Peninsula (West), at Ceduna, Wednesday, July 5th. (Secretary, Mr. K. Harrison, Smoky Bay.)

Far North, at Morchard, Wednesday, July 19th. (Secretary, Mr. A. McCallum.)

Murray Lands (West), at Karoonda, Thursday, August 3rd. (Secretary, Mr. M. N. Blacket, Wynarka.)

Eyre's Peninsula (East), at Cowell, Thursday, August 10th. (Secretary, Mr. Guy E. Smith, Cowell.)

Southern, at Goolwa, Thursday, August 17th. (Secretary, Mr. D. Jeff Gordon, Currency Creek.)

Hills, at McLaren Flat, Thursday, August 24th. (Secretary, Mr. P. T. Wait.)

Murray Lands (East), at Taplan, Tuesday, September 26th. (Secretary, Mr. P. R. Hodge, Nangari.)

Pinnaroo Line, at Parilla, Thursday, September 28th. (Secretary, Mr. C. S. Foale.)

Eyre's Peninsula (Southern), at Cummins, Wednesday, October 4th. (Secretary, Mr. H. M. Roberts.)

Eyre's Peninsula (Central), at Minnipa, Friday, October 6th. (Secretary, Mr. D. V. Kitto.)

Each Conference will commence at 10.30 a.m.

Pruning Competitions.

Lower North, Angaston, June 19th; Light's Pass, June 21st; Lyndoch, June 26th; Williamstown, June 28th; Lone Pine, June 30th; Greenock, July 3rd; Koonunga, July 5th; Watervale, July 7th; championship at Angaston, July 15th.

McLaren Flat, June 24th.

Roseworthy College Investigational Work.

Certain viticultural studies are being carried out by Mr. J. L. Williams (Viticulturist) and Mr. A. R. Hickinbotham (Chemist) in collaboration. (1) During vintage the opportunity was taken to conduct two uniformity trials, one at the College (567 vines) and one at Lyndoch (396 vines), and the analysis of the results is now in progress. The grapes from each vine were picked, weighed, and the weights recorded separately. The object is to measure as closely as possible the variability of a normal area of vines. The data will serve as a basis for planting a permanent manurial trial on vines. (2) The collection of total seasonal growth from three vines, at intervals of three weeks throughout the season (48 samples), has been completed. The material has been dried and prepared for analysis. The results of the analyses of the various samples will serve to indicate the rate of absorption of nutrients throughout the season. The experience so gained should enable a more intelligent application of manures in the permanent trial.

Twin lamb disease investigations are being continued. Forty ewes are under test, and are due to lamb in April. The object of the test is to ascertain, if possible, the conditions predisposing to disease and gain further data on symptoms, &c. The ewes have been fed for several weeks on nothing but dry feed, consisting of wheaten and oaten chaff. About a dozen blood calcium determinations have been made, and practically all gave results of from 10 per cent. to 15 per cent. below normal. One case of the disease has been induced, and this is the only case in the whole of the flocks so far this season. Treatments of the disease are also receiving attention. There are certain studies for which the College has not the necessary equipment in connection with these investigations, but experimental material from any cases will be supplied to the Animal Nutrition Branch of the C.S.I.R. for their study

The sheep feeding experiment is progressing satisfactorily. This was commenced on February 15th. The work is being conducted with 60 Merino and 60 Dorset Horn-Merino ewes which were mated to Southdown rams on November 22nd. The 120 ewes are now grouped into six lots of 20, and each lot contains 10 Merino and 10 Dorset Horn-Merino ewes. Six fenced plots of equal area and all carrying stubble left from a wheat crop which was harvested for grain are being used for the experiments.

The approximate average weight of the sheep in each plot at the beginning of the experiment was 130lbs. On the basis that 0.5lb. of protein per week is sufficient to maintain a sheep of 130lbs. live weight, each ration fed is designed to contain 0.5lb. protein per head per week irrespective of the weights or other contents of the rations. The following is the daily ration distributed to each group:—

Group.	Ration.
1	Chaff, 1lb. 6ozs.
2	Oats, 1lb. 3ozs.
3	Ensilage, 5lbs. 5ozs.
4	Ensilage, 3lbs. 13ozs.; bran, 4ozs.
5	Meggitts linseed sheep nuts, 4.8ozs.
6	Green lucerne, 2lbs. 10ozs.

To each lot a mineral lick has also been made available, consisting of salt 100 parts, superphosphate (45 per cent.) 60 parts, Epsom salts 10 parts.

A detailed report on this work will be published on completion.

Bitter Pit in Apples.

Seeking information regarding the comparative susceptibility to Bitter Pit of different varieties of apples on Northern Spy and Winter Majetin stocks, the Longwood Branch of the Agricultural Bureau has been advised by the Manager of the Blackwood Orchard (Mr. R. Fowler) that much research work has been done in this direction at the Blackwood Experiment Orchard.

In the Bitter Pit trial plot there are 82 trees, each representing a different line of research into this question, and included amongst them are trees of Cleopatra, Jonathan, Esopus Spitzenberg, Baldwin, and Shockley worked on both Northern Spy and Winter Majetin stocks. These experiments were started in 1910, and the results have been carefully recorded ever since. The figures have been tabulated for the 10-year period, 1917-18 to 1926-27, and a table is appended showing the results. It will be noticed from the figures that Cleopatra, Esopus Spitzenberg, and Baldwin, the varieties most susceptible to Bitter Pit, show a higher percentage of this trouble on the Winter Majetin stock than on the Northern Spy, while the less susceptible varieties—Jonathan and Shockley—show the reverse.

It is noted that members of the Branch hold the opinion that the Majetin stock gives better results than the Spy, but the carefully tabulated records of the experiments hardly support this view. It will be noticed also that the mean average crops over the 10-year period under review are much heavier on the Spy stocks than on the Majetin. Though it is generally accepted that apple varieties do well on the Majetin stocks, they have not done as well at Blackwood as similar varieties in the same class of soil on Northern Spy roots, nor have they produced anything like the same crops. Undoubtedly, the question of the influence of various stocks on the incidence of Bitter Pit in certain varieties of apples is a matter for serious consideration. Recent scientific research into the cause of Bitter Pit on the tree or Blotchy Cork, as it is now called—the term "Bitter Pit" being applied to the spots developed in cold storage considered to be due to immaturity at picking time—has thrown much new light on the probable causes of both Blotchy Cork and Bitter Pit, and it would seem that one of the main contributing factors is the ability or inability of the root system to supply sufficient moisture during short periods of hot and dry climatic conditions to replace moisture lost through transpiration from the leaves, causing them to withdraw water from the fruit, which brings about a concentration of cell sap in certain cells and the increased acidity of this cell sap causing the death of the surrounding tissue, bringing about the characteristic brown spots.

If this theory is accepted as correct, then the apple root stock that will provide the most extensive root system should be better able to maintain the moisture requirements of trees worked upon it than a stock with a less well provided rooting system. From this point of view, the Northern Spy certainly has an advantage over the Majetin which is inclined to produce roots mostly bare of fibrous branches and penetrating deeply into the soil, while the Spy generally produces roots which are much more widely branched, have much more fibrous branches, and cover a larger area of soil.

"Bitter Pit" Trial.—Ten-year Period, 1917-18 *to* 1926-27.

Variety.	Stock.	Mean Average Crop in Lbs.	Pitted Fruit.	Percentage of Pitted Fruit.
Cleopatra	Northern Spy..........	114·57	13·51	15·47
	Winter Majetin	82·68	15·81	21·88
Jonathan	Northern Spy..........	58·06	14·91	28·05
	Winter Majetin	30·51	1·94	20·44
Esopus Spitzenberg	Northern Spy..........	73·41	13·21	24·77
	Winter Majetin	13·24	2·72	32·31
Baldwin	Northern Spy..........	154·09	47·59	42·53*
	Winter Majetin	21·0	12·71	58·77*
Shockley	Northern Spy..........	58·06	14·91	28·05
	Winter Majetin	13·91	2·95	15·4

* Average for three years.

Use of the Roller.

The compacting of land which has been autumn-ploughed before being seeded to cereals is of the utmost importance, and if heavy enough rains do not fall to do the job of consolidating the land before the seed drill is started, great advantage follows the use of a heavy roller or packer. This advice has been given by Mr. W. J. Spafford (the Deputy Director of Agriculture) to a farmer who intends putting in about 300 acres of old land to be ploughed and who desires to know if rolling before seeding with a combine would be an improvement. The soil is ironstone gravel and sandy, and the roller is a boiler which is used for scrub rolling.

Mr. Spafford further states that the packing should be done before seeding if possible, but failing that, good will result from going over the land with the roller after the crop is well up. For heavy-textured ironstone soils a ribbed roller or culti-packer would be better than a plain roller, but provided the land is immediately harrowed or lightly cultivated soon after the rolling given before seeding, the plain roller should prove almost as effective as other kinds of implements, and a roller made from an old boiler should prove quite suitable for the work.

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Official Herd Testing.

Commencing on the 1st July, 1933, the fees for the official testing of cows will be as follows:—

Herd entry, £6 10s. per herd.
Testing fees, 10s. per cow per lactation.

The minimum annual charge for herd entry, plus testing fees, will be £8 10s., and for this sum four (4) or less cows of a herd will be tested.

In addition to these charges, a levy of 10 per cent. will be made on the selling prices of all bulls sold under the subsidy scheme.

Every breeder who wishes to have his herd tested should apply, in writing, to the Department of Agriculture, and should send, at the same time, a cheque for £8 10s. This will pay the entry fee for the herd and the testing fees for the first four cows. Fees at the rate of 10s. per head, for cows in excess of four in number, will be collected as they come under test. Herds eligible for testing are:—

Group A.—This group comprises those herds which consist of ten (10) or more pure bred cows registered in a herd book, or accepted for herd book registration.

Group B.—These are the herds which consist of less than ten (10) pure bred cows registered, or accepted for registration in a herd book. Such herds will be tested in pairs provided—(*a*) that the Department can arrange for each pair to be tested on the same day by the same official tester; and, (*b*) that the aggregate number of registered pure bred cows owned by the pair is not less than ten (10).

Group C.—In instances where the Department is not able to pair off the herds in the way mentioned for Group B, other methods of grouping may be adopted, or the herds which remain unpaired may be tested on separate days. But these innovations are subject to the convenience of the Department and to a larger herd not being excluded.

Refund of Fees.—Should the Department be unable to commence the testing of a herd, the fees paid on it will be refunded.

Dairy Certificates.

The following candidates qualified for certificates under the Dairy Industry Act, 1928, in the examinations in milk and cream testing and cream grading held at Adelaide and Mount Gambier in March and April, respectively:—

ADELAIDE.—*Milk and Cream Testing.*—Daisy E. A. Aslin, Hilda K. Sharley, Patricia O. H. Ashton, Oliver M. Hines, Cecil A. Schubert, Edward A. R. Turner, James W. Jennings, Herman C. Johnson, Helen M. Bowen, Helmore A. R. Turner, Robert D. Jones, and Ivy Rogers. *Cream Grading.*—Cecil A. Schubert, James W. Jennings, Bernard R. McNamee, Robert D. Jones, Edward A. R. Turner, and Helmore A. R. Turner.

MOUNT GAMBIER.—*Milk and Cream Testing.*—Alfred V. Chambers, Laurie F. Burton, and Lewis G. Harrison. *Cream Grading.*—Laurie F. Burton, Alfred V. Chambers, and Lewis G. Harrison.

Publications Received.

"Varieties of Wheat in Australia," Bulletin 72, Council for Scientific and Industrial Research, Melbourne.

AGRICULTURAL INQUIRIES.

[*Replies supplied by Mr. W. J. Spafford (Deputy Director of Agriculture).*]

Seed Wheat.

The Balhannah Branch of the Agricultural Bureau asks would it be advantageous to hold seed wheat for 12 months and sow the following year. Reply—**No advantage is likely to follow the holding of seed wheat for 12 months before using it, particularly as it must be so carefully stored to keep it free from weevils. On the other hand, provided that it is not affected by grain-eating insects, one-year-old seed will germinate just as well as new season's grain.**

Possibilities of Growing Ginger, Linseed, Canary Seed, and Chicory.

Loveday asks for information concerning the possibilities of growing ginger, linseed, canary seed, and chicory. Reply—*Ginger* is a plant grown in or near the tropics, and as it does well in Queensland, it can hardly be expected to do well at Loveday. It is grown from roots, and about 1 ton of roots is required to plant an acre. As the nearest place where roots could be secured is Queensland, they would be very expensive. *Linseed* grows fairly well where wheat crops grow really well, although it needs a cooler spring climate than most of our wheat-growing districts experience. It might do fairly well under irrigation at Loveday. Sown in May at the rate of 1bush. of seed per acre with 1½cwts. superphosphate, on really clean land fair yields could be anticipated if it were watered occasionally, provided it was not attacked by caterpillars after the seed had set. Unfortunately, we have never heard of the introduction of varieties that prove good seed-producing kinds in our climate, although there have been a number of good fibre-producing varieties brought in at different times. *Canary Seed* can be grown in the good wheat-growing districts of the State in much the same way that the cereals are grown, but the crop is much more difficult to harvest than are any of the cereals. There is a very limited market for this seed in this State now that so much is being grown here. *Chicory* is grown in deep, rich peat soils, and the small local market is supplied from Rendelsham.

Seeding Operations.

The Bunora Branch of the Agricultural Bureau asks: (1) ''After having fallow last year, and having a good running stubble fire, the land was cultivated after the burn, and barley grass seed was very prominent. Would it be better to sow this land dry if the season is late, or wait for a rain and cultivate again.'' Reply—In the Bunora district it is essential that the seed of the cereals be sown relatively early, and if opening seeding rains do not fall by the middle of May, seeding should be commenced, remembering that if the land is dry there is no need to pickle, and the quantity of seed to be used should be increased. If the rate of sowing is 50lb. when germinating conditions are good, increase it to 65lb. to 70lb. for ''dry'' sowing. (2) ''Should clean fallow be worked over dry or wait for rain, if season is late before seeding?''—Reply—Clean fallow is only cultivated if it has set together by rain falling on it, and if it is loose on the surface and free from weeds, it need not be cultivated before seeding, if the seed is to be sown when the land is still dry.

Pickling for Oat Smut.

The Secretary of the Clanfield Agricultural Bureau asks: ''Is carbonate of copper a better pickle than bluestone for oat smut?'' Reply—The control of the smut of oats is very difficult because some of the minute spores from which the fungus springs are found behind the folded-over skin which encloses the grain. The liquid ''pickles'' have more chance of coming in contact with those protected spores than has the dry copper carbonate powder, and they prove more effective than the dry pickle. One per cent. solution of bluestone in water (1lb. in 10galls.) controls oat smut fairly well if sprinkled on a heap of grain, and the mass then turned over several times with a shovel as if mixing mortar. Formalin, because of its tendency to spread when poured on to anything dry, is probably the best of the pickles for controlling oat smut. It should be used at a strength of ¼ per cent. (1lb. in 40galls. of water), but it must be remembered that the seed should be sown whilst still damp, immediately after pickling.

SUBTERRANEAN CLOVER.

Bulletin No. 240, ''Subterranean Clover,'' by W. J. Spafford, Deputy Director of Agriculture, has been reprinted, and copies can be had on application to the Department of Agriculture, Education Building, Flinders Street, Adelaide.

FARM GATES.

[By R. L. Griffiths, Agricultural Instructor.]

A most unsatisfactory feature of many farms is the gates. It frequently appears that a farmer, who will freely spend time and money in the erection of substantial farm buildings, and thoroughly subdivide his area with good fences, will not complete the improvements by the provision of gates, but for many years will allow the farm entrances and openings between paddocks to be inadequately closed by temporary makeshifts. It may be that the deficiency is not noticed by the owner of the farm as use becomes second nature, but it is very noticeable to visitors who travel from one farm to another and who constantly are compelled to spend time and exercise ingenuity in opening and closing weird and wonderful contraptions.

No useful purpose can possibly be served by poor gates. The cost of good ones, in comparison with the total cost of improvements and fencing, is very little, and their value is many times greater than the initial cost. Nothing improves the appearance of a farm more than a neat, useful entrance way, with good subdivision gates, and nothing gives visitors a better impression of the farm management.

1. A disgrace to any farm.

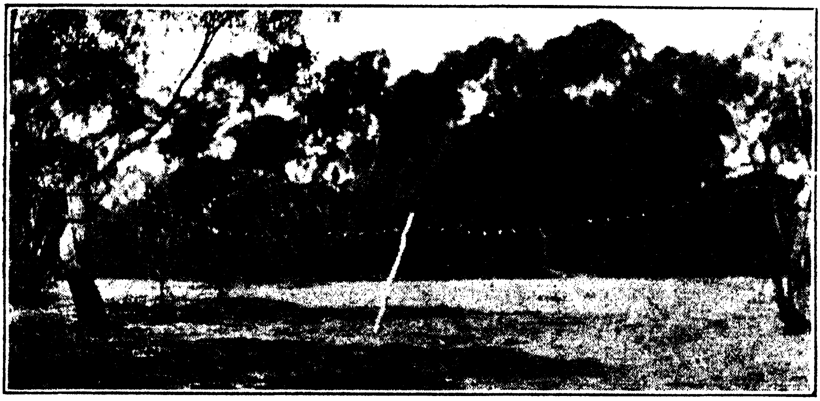
From the farmer's own point of view, also, there are many advantages. The working time lost in manipulating poor gates must amount to a very considerable total during a year, actually making these gates much more expensive than better ones. Also the dangers to stock from straying through poorly guarded openings are many and serious. The wire gates so often seen are inefficient and expensive when in gateways frequently used, although they may be considered adequate between paddocks for openings that are needed only occasionally.

SLIP RAILS.

In the earlier years of settlement, with plentiful natural timber, slip rails were of common use in gateways. Although effectively closing the opening, the time spent in opening and shutting them was excessive, and so now they are very seldom seen.

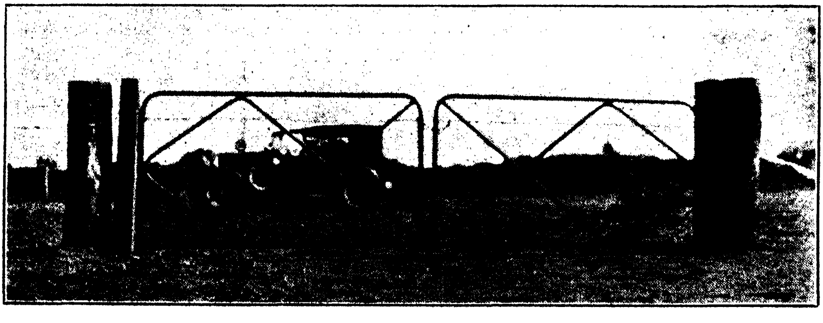
ALL METAL GATES.

During recent years so many excellent metal gates have been manufactured that more of these are now used on farms than any other kind. If well erected, they have much to commend them, being neat, effective, and procurable in the weight and strength required. Illustrations 3 and 4 show useful farm entrances with iron gates.



2. A vermin-proof netting fence spoilt by this gate.

It must be remembered that a stronger gate is required for wide openings than for narrow ones. Illustration 6 shows an iron gate, quite useful in small sizes, but liable to twist and sag in greater widths.



3. Neat and useful entrance gates.

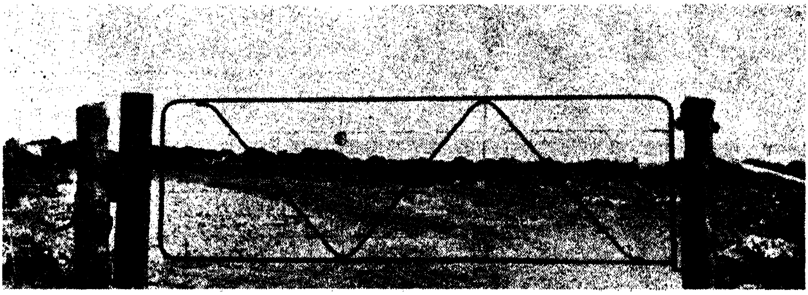
For very wide openings, over 12ft., it is probable that a pair of gates will be more effective than one wide one, because, although the time taken in opening a pair of gates is somewhat longer, the strain on gate and post is much less, and the life of both correspondingly prolonged.

WOODEN GATES.

Wooden gates manufactured on the farm have many advantages. They can be made and repaired when necessary during slack periods, most farmers having sufficient knowledge of carpentry to make wooden gates and of blacksmithing to make the hinges, when the making and repairing of all metal gates is beyond their capacity.

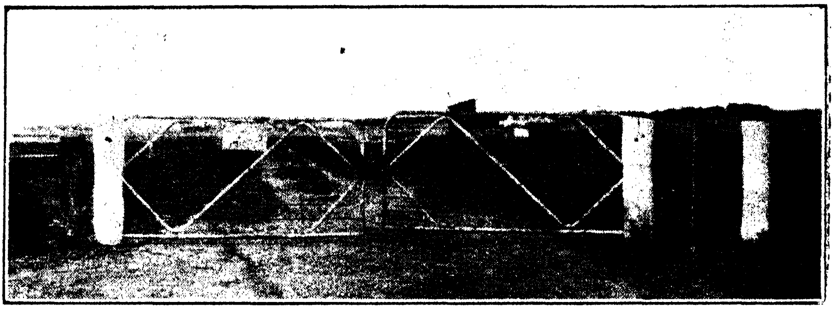
The chief essentials to be considered when constructing wooden gates are lightness and stiffness. Illustration 8 shows the wrong way to build a wooden gate, this one being heavy and with no adequate bracing to prevent sagging at the closing end. It is wise to build wooden gates with narrow rails, thus reducing wind resistance, making them sheep and vermin proof by the use of wire netting when necessary.

All wood for gates should be painted before the gate is put together, as by this means there is paint between all the joints, and the gate will then resist the effects of weather for a much longer period. A final coat of paint after erection will greatly improve the appearance.



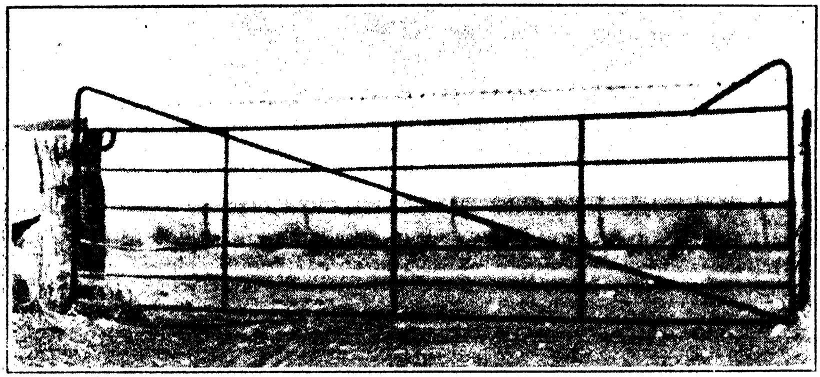
4. A useful all metal farm gate.

Wooden gates can be built in various styles, according to the fancy of the farmer. Illustration 9 shows simple and effective batten gates—drawn in proportion for a 16ft. opening. Their advantages are that all the timber is of the same dimensions, 3in. x 1in. or 3in. x 1½in. hardwood or oregon; there are no mortise and tenon joints, the timbers being bolted together; they are light, though strong, as hanging heads, closing heads, and braces are on both sides of the rails; they are very easily kept tight by screwing up the bolts when necessary, and very easily repaired if broken.



5. Gates in railway fences—strong and well erected.

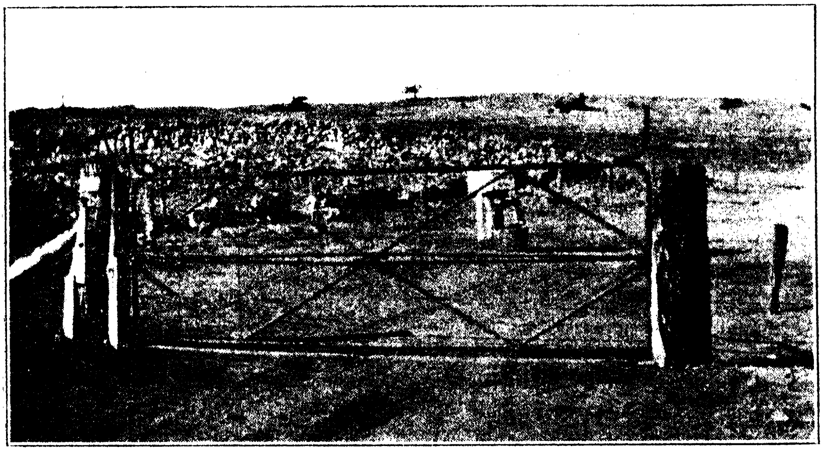
The total materials necessary for these gates, apart from the hinges, are 150ft. of timber and 30 ⅜in. bolts—4in. long if timber 1in. in width is used. Bolts should be square headed, as round headed bolts are often difficult to tighten after the gate has been exposed to the weather for a time. In these gates the projection of hanging and closing heads above and below the rails, and the projection of rails beyond the heads, prevent any danger of the timber splitting at the bolt holes. The only necessary tools for making these gates are rule, square, brace and bit, saw, and spanner.



6. A light weight iron gate, useful in small sizes.

WIDENING OF EXISTING GATEWAYS.

During recent years the purchase of wider implements and machinery has often made necessary the widening of original gateways. The opening of very wide gates for ordinary traffic is awkward, and Mr. W. Adams, Building Instructor, Dookie Agricultural College, Victoria, has suggested an excellent dual purpose gateway. Illustration 10 shows this arrangement.



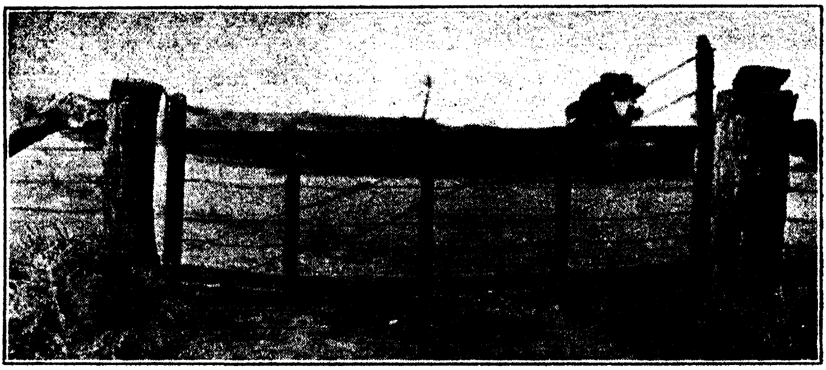
7. An effective means of preventing gates being damaged by stock.

At the closing head of the original gate is set a sawn post about 6in. x 3in. in dimension. In the ground is set a small oil drum, filled with concrete, except for an opening, into which the base of this post fits. On the far side of the sawn post from the original gate two strips of wood are attached, which fit on each side of the closing head of the additional gate.

By this means the original gate can be used alone for all ordinary traffic, but by lifting out the centre post the whole width is available for wide implements. To avoid the hole in the concrete becoming filled with dirt while the full gateway is in use, a cover may be made from an old plough disc, to the centre of which is attached a short length of 6in. x 3in. timber.

USEFUL HINTS ON GATES.

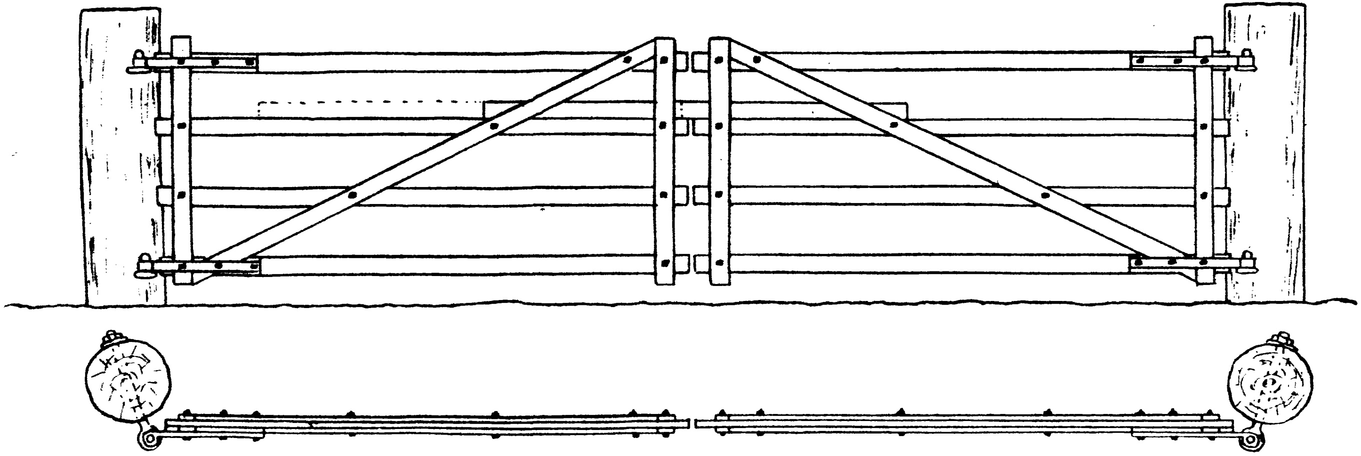
Gates should not be hung from straining posts. No matter how well braced a straining post may be, the pull of the wires will move it to some extent, and this will alter the hanging of the gate. Separate gate posts should be used, well set into the ground, and for the sake of appearance, squared posts, somewhat higher than the fence, are an advantage. Separate gate posts are seen in Illustrations 3 and 5.

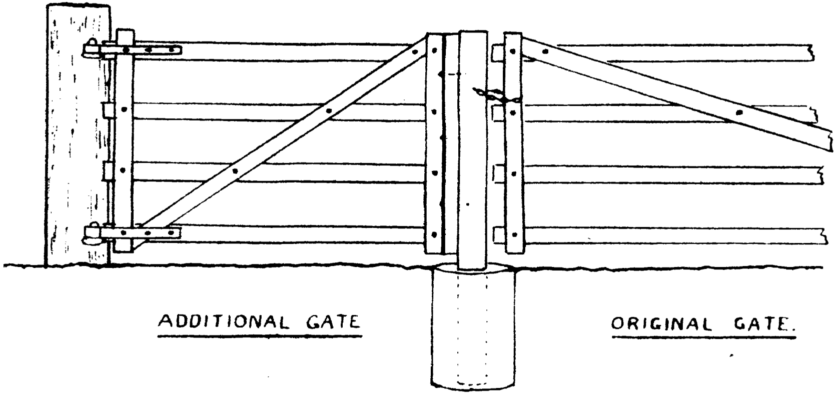


8. The wrong kind of wooden gate—heavy and badly braced.

If the fence is to be vermin proof, a wooden sill should be fitted between the gates posts at ground level. It is foolish to build rabbit-proof netting fences and allow free movement of vermin through the gateway. Illustration 2 is an extreme example of this. The netting fence was quite rabbit proof, and the gate consisted of a piece of netting loosely pulled across the opening.

It should be remembered that the weight of a gate pulls away from the post at the top and presses towards it at the bottom. For this reason the top hinge should always go completely through the post and be fastened by a nut, while the bottom one may safely be only driven into the post. Also for this reason a gate should be braced from the bottom at the hinge end to the top at the closing end. This is one of the most common mistakes in the making of wooden gates. Many of them are seen with the brace from the top at the hinge end. In some cases, as in Illustration 11, the hanging head is extended, and the brace placed higher still. This is a very foolish procedure, as it increases the pull on the top of the post, and any slight movement of the post in consequence, or any warping of the hanging head, will allow the gate to drag at the closing end.





Above.

9. Light weight strong wooden gates, cheaply and easily constructed by the farmer. Lower diagram shows the best method of hanging gates, allowing them to swing clear of opening.

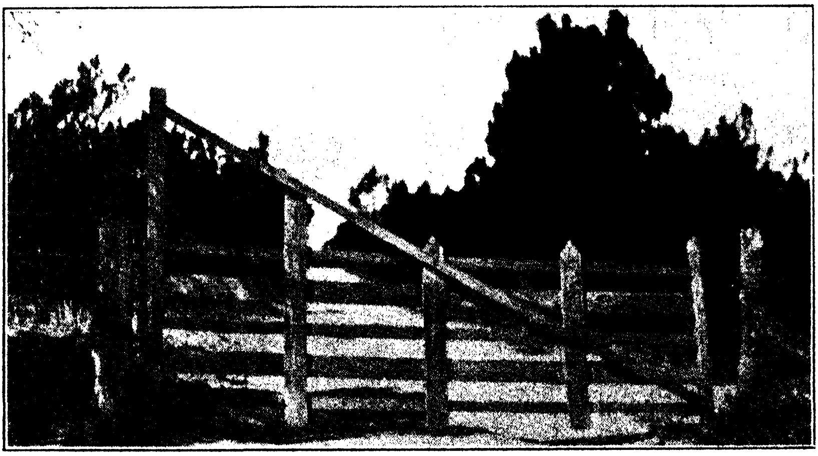
Left.

10. Method of widening an existing gateway, so that the original gate may still be used for ordinary traffic, and the full width when necessary.

The only effective brace is from near ground level at the hinge end, as this allows the base of the gate post to take as large a proportion of the weight of the gate as possible. Illustrations 9 and 10 show wooden gates braced in the correct way.

It is wise to hang gates with the hinges somewhat at the back of the gate posts instead of projecting into the gateway. By this means the gates swing clear of the opening, and in the event of a collision the gate post will take the shock, and so prevent damage to the gate. Illustration 9 shows this arrangement in detail, while the gates shown in Illustration 5 are hung in this way.

Livestock, horses in particular, sometimes develop a habit of rubbing against or pawing at a gate and very quickly cause damage. On this account many wooden and iron gates are seen wrapped with barbed wire, which is unsightly, and also often does not stop the trouble. Illustration 7 shows a very much better way of preventing stock causing this damage. The top of the gate is protected by short uprights with a barbed wire stretched between them. Half way up the gate, at each end and in the centre, are placed cross pieces, the centre piece being longer than those at the ends. Through holes near each end of the cross pieces are light iron rods, the full width of the gate. The rods are wrapped with barbed wire and quite effectively prevent any stock from touching the gate. This type of protection could be adapted to almost all styles of gates.

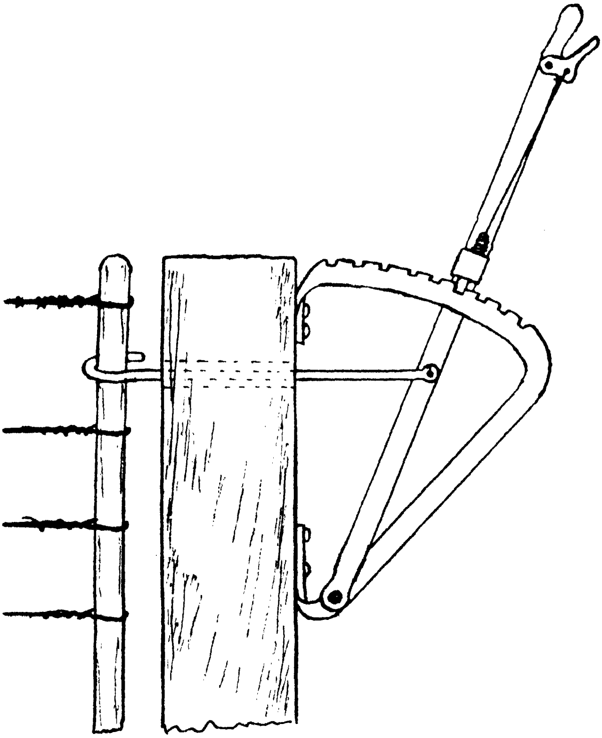


11. A brace from the top at the hinge end is not satisfactory.

Wire Gates.

In all farming districts wire gates may be found, although they are undoubtedly more common in recently settled areas. In style they range from the very crude, of separate barbed wires, each fastened to the posts, which take quite a considerable time to unfasten, to much more elaborate structures made of netting, barbed wire, and fencing droppers, with different systems of fastening to ensure complete straining of the wires while the gate is closed.

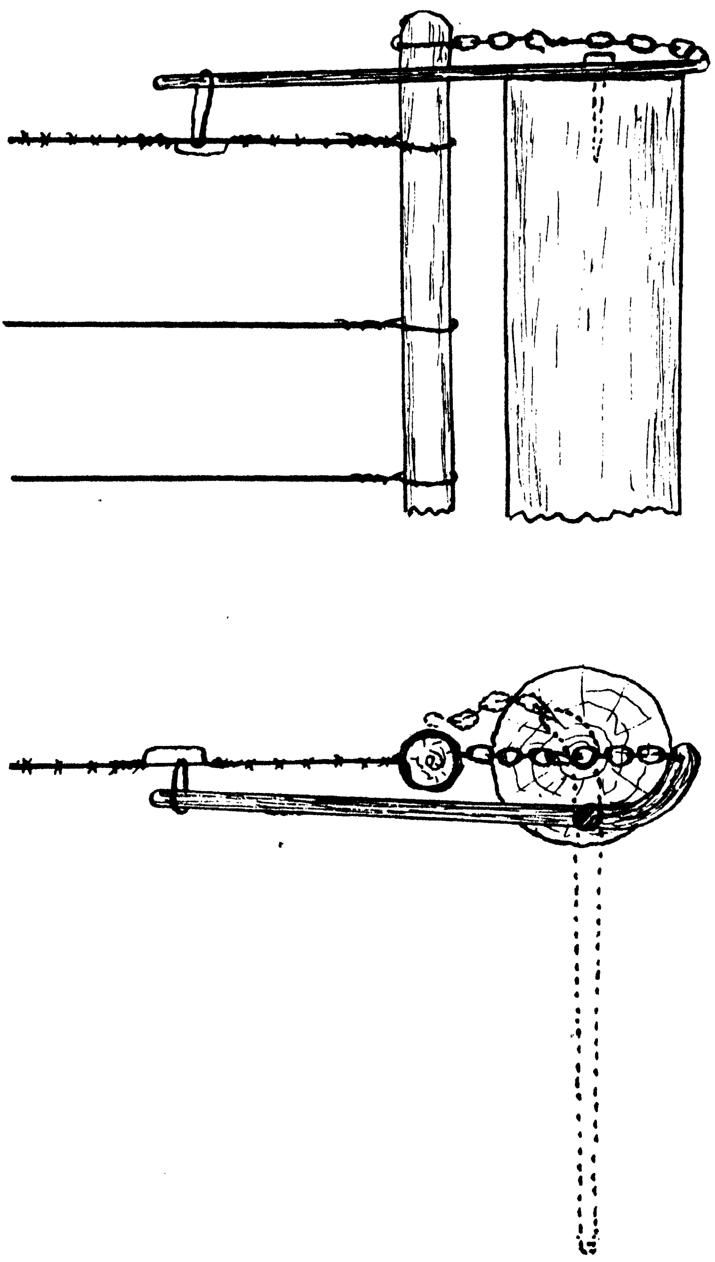
They are all clumsy, and many of them are very awkward to handle, particularly by women and children, as strength is required to lift the upright at the closing end into some sort of socket or wire loop near the base of the post, and to disentangle the wires which have usually become twisted while the gate is open. Then it often happens that the stranger is completely puzzled by the device for closing and straining the gate, with the result that it is left open or insecurely fastened. They are only justified in gateways which are not often used, but because they are so common, diagrams are given here of the most effective means to close them. (Illustrations 12, A, B, C, and D).



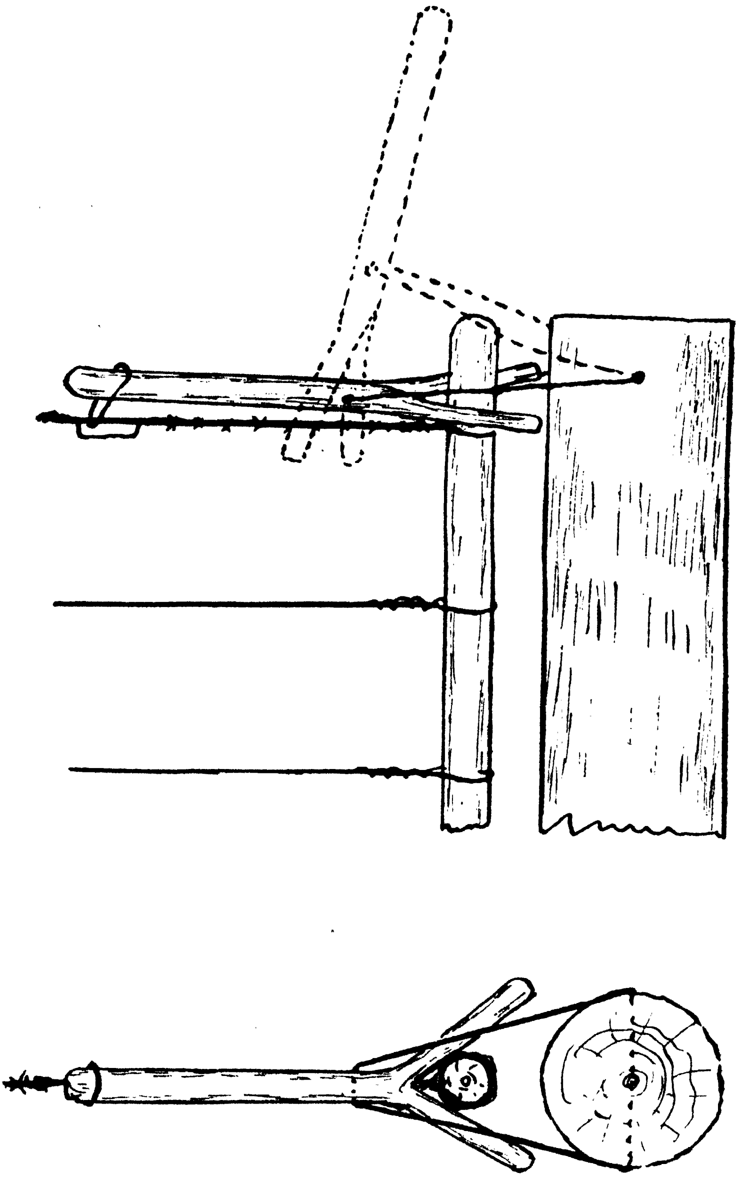
12A. Fastening for wire gate made from old rack and lever from a worn-out implement.

The first one (A), probably the best, is easily constructed when a rack and lever is obtainable from any worn out implement. It is attached to the back of the gate post, and can be arranged even when the post is used as a strainer. The use of the lever explains itself, and the gate can be pulled very tight by this fastening.

The next (B) is more simple and almost equally effective. An iron lever, curved at one end, with a few links of chain and hook attached, is fastened to the top of the gate post. The dropper at the closing end of the gate also has

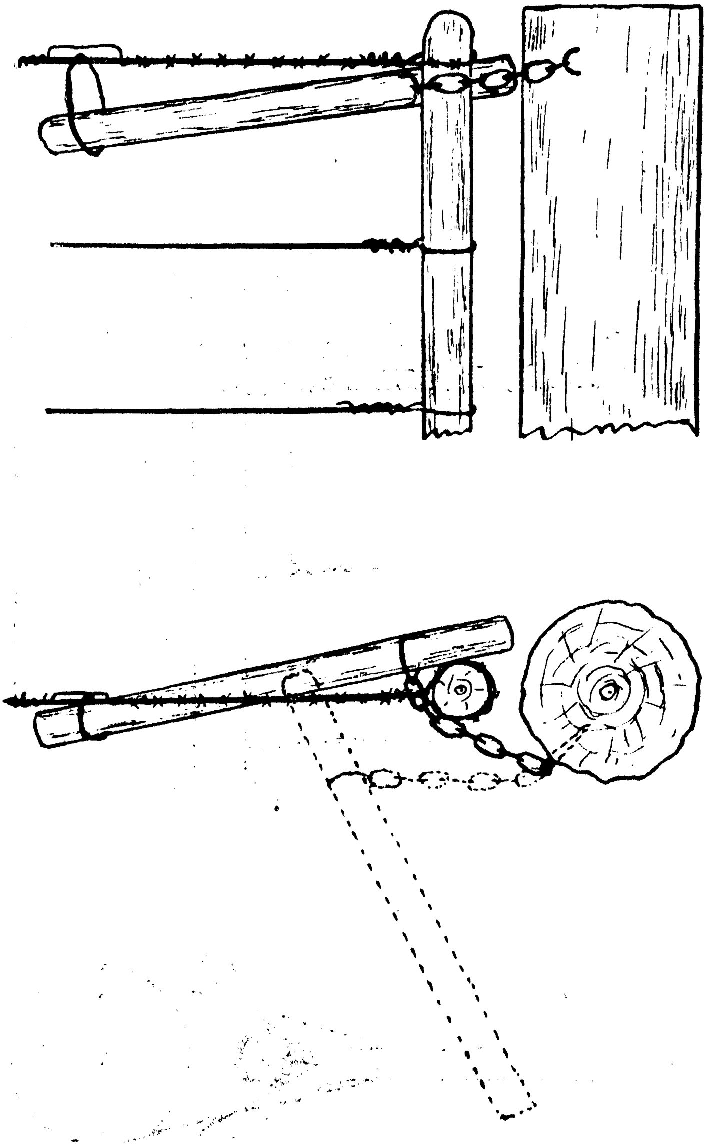


12B. Fastening for wire gate, consisting of iron lever with chain and hook attached. (Side and top views.)



12C. Fastening for wire gate made from a forked stick.
(Side and top views.)

chain links attached, and by means of the hook and lever any necessary strain can be obtained, the end of the lever then being fastened by a wire loop to the top wire of the gate.



12D. Fastening for wire gate most commonly seen, using stick with chain attached as a lever. (Side and top views.)

Diagram C shows a still less elaborate, but reasonably good, fastening. The leverage obtained by the wooden fork over the closing dropper is sufficient to hold the gate fairly tight, provided the wires do not stretch or the gate posts shift.

Diagram D shows the fastening which, with some variations, is most commonly seen. It also gives leverage sufficient to strain the gate reasonably tight.

With the two latter systems it is sometimes quite an interesting occupation to hold the gate with one hand while striving to manipulate the lever with the other.

Ramps for Motor Traffic.

Since motor transport has become common, some farmers have built ramps beside the farm entrance and other gates frequently used for motor cars and trucks. Such a ramp, with a useful gateway, is shown in Illustration 13. Should there be much motor traffic at the farm, the building of ramps, at least through the fences between the roadway and the homestead, is fully justified, as the saving in time will quickly repay the outlay for work and material.

Ramps of various kinds are seen, that most common being constructed of sawn timber cross pieces, spiked or bolted, at intervals of 9in. to 1in., to heavy beams. The most effective type, however, is made of iron piping, 2in. to 3in. in diameter, the piping being stapled to the wooden carrying beams in such a way that each pipe can turn freely. This is more effective in preventing the crossing of animals than the timber ramp.

13. A useful entrance gate, with a ramp for motor traffic.

A ramp should be sufficiently long to discourage horses from jumping it and sufficiently high above the ground to discourage cattle from walking through it. Thoughtless motorists will damage ramps by crossing them too quickly. This may be prevented by building them higher in the centre than at the ends, and by making them sufficiently narrow in width to discourage speeding.

The usual excuse given for poor gates is the cost of buying or building good ones. Just at the present time this may be a justifiable reason, but under normal circumstances it is not so, as the initial cost of the gate is quickly recovered by the time saved in the movements of men, stock, and equipment during the farm operation, and, in addition, the improved appearance of the farm is a definite asset to the owner.

RUST IN WHEAT CROPS IN SOUTH AUSTRALIA, SEASON, 1932-33.

[By R. C. Scott, Supervisor of Experimental Work.]

At one time during the course of last season the prospects of a record wheat yield in South Australia appeared particularly bright, and it was confidently estimated that a return considerably exceeding 50,000,000bush. would be gathered in the State. However, generally speaking, crops failed to mature as well as anticipated, and by harvest time it was realised that this return wóuld not be secured. Chief amongst the reasons for the lower yield was the damage caused by red rust, and some facts relative to its prevalence in different districts and the ability of wheat varieties to withstand attack from this disease are of interest.

Red rust of wheat has always proved a serious disease in Australia. It was first noted in New South Wales in 1825 and, as the industry developed quickly, assumed serious proportions. With the production of improved varieties the damage became less and severe attacks more widely spaced. However, from time to time outbreaks occur which cause considerable loss, and such was the case in 1932.

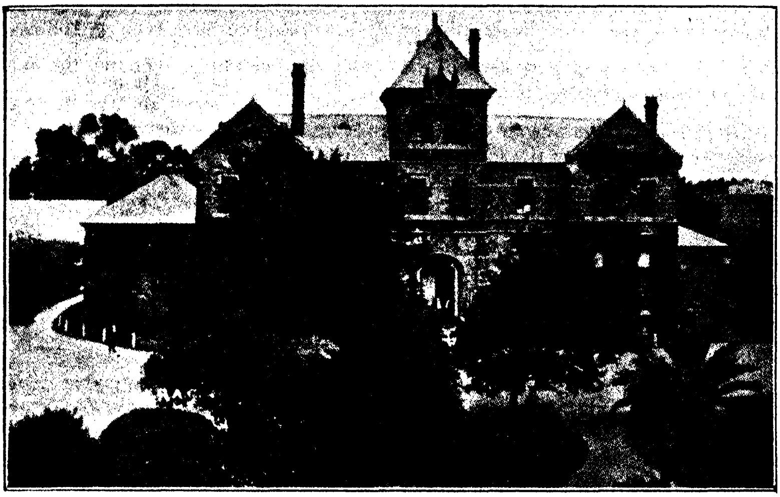
When grown under conditions favorable to the disease, no variety is absolutely "rust proof," but because of some characteristic in their constitution certain varieties are much more resistant than others.

For extensive damage to take place it is necessary that in the first place climatic conditions favorable to the development of rust spores should be experienced, and secondly, that the crop should be in a stage of growth when it is susceptible to attack. Both these conditions must occur at the same time, and consequently there is variation in the severity of the disease from season to season and even in the one season from district and district and crop to crop.

There are two rusts affecting wheat in South Australia, namely, *Puccinia graminis*, commonly known as red or stem rust, and *Puccinia triticina*, termed spring, orange, or leaf rust. The latter occurs mainly on the upper surface of the leaf and usually earlier in the season than red rust. The spores are orange yellow in color and are situated beneath the epidermis of the leaf, but do not burst through. Recent work has indicated that this form of rust has appreciable influence on the setting of grain of affected plants, and consequently reduces the yield, but does not depreciate the quality of the grain to the same extent as red rust.

There are a number of forms of red rust attacking plant life and within that which affects wheat there are several physiologically different strains, each of which have distinct powers of infection. Consequently, it may so happen that a variety which exhibits resistance to one strain may prove susceptible to another. However, so far as the wheat producer is concerned the actual strain is not important since each affects the plant in a similar manner. As a general rule red rust is much more serious than leaf rust. It may occur on any part of the plant, forming clusters of reddish colored spores beneath the skin. As these spores mature they rupture through to appear as fine, reddish dust on the outer surface of the leaf, stem, or ear. In the development of the spores, plant food which should be utilised for the filling of the seed is extracted, with the result that grain harvested from rust affected plants is more or less shrivelled.

No treatment in the field is practicable, and consequently apart from the growing of rust-escaping varieties it is essential that we concentrate on those wheats which show resistance to the disease.



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PREVALENCE OF RUST.

The reports obtained from the Agricultural Instructors indicate that the disease was fairly widespread, and briefly the position appears to have been as follows:—

Central District.—Red rust caused a considerable amount of damage, the earlier and denser crops suffering more than others.

Murray Mallee.—Rust caused very little damage in this district, and only a few cases were seen where the yields were seriously reduced or the sample damaged by this disease. Generally speaking, self-sown crops and those planted out of season were most affected.

Lower North.—Rust made its appearance in two periods, namely, early September and late in October or early November. The September attack appeared to affect grain formation and the latter attack, the plumpness of the grain. Continuous light rains, damp overcast conditions, and heavy dews favored the development of rust, and much damage was caused by this disease.

Upper North.—The weather conditions during the middle of September favored the development of rust and led to the severe attack of the sappy, bulky crops in the early maturing districts. Those principally affected were situated west of Flinders Range from Baroota in the north, through Port Germein, Telowie, Nelshaby, Warnertown, Port Pirie, to Wandearah East and West. In the later ripening and heavier soil portions of the district the disease was not so severe.

Southern Eyre's Peninsula.—Rust was fairly general, the only district which did not suffer to any extent being Kimba. The strip of country adjoining the coast from Tumby Bay to Cowell was the most seriously affected, and some of the crops were almost totally destroyed.

Northern Eyre's Peninsula.—Considerable amount of rust was present throughout the district, the earlier sown crops being more affected than those planted later. In the majority of cases, leaf rust was the worst trouble, affecting the setting of the central grain in the spikelets and reducing the size of the others, although without much shrivelling.

South-East.—Rust was widespread throughout the district, most crops containing a sprinkling, although relatively few were seriously affected.

VARIETIES.

Considerable variation in the susceptibility of varieties was noted, much depending upon the time of planting and the thickness of the crop. Further, some wheats matured their grain fairly well, although relatively heavily infested with disease, whilst others apparently infected to the same degree were badly damaged. However, from the reports received the relative degree of resistance of the more widely grown varieties appears to be as follows:—

Very Resistant.	Resistant.	Susceptible.
Ford	Nabawa	Caliph
Sword	Currawa	Federation
	Quality	Felix
	Florence	Gallipoli
	Waratah	Gluyas
		Late Gluyas
		King's White
		Ranee
		Sepoy
		Sultan

The two outstanding wheats for the year were Ford and Sword, each of which withstood red rust attack extremely well, and in practically all instances ripened grain of good quality. Both originated at Roseworthy Agricultural College and possess the following pedigrees:—

Ford	Fancy	Fan Comeback
	Crossbred 53	Zealand Tardent's Blue
Sword	Sultan	King's White Caliph
	Ford	Fancy Crossbred 53

These wheats are therefore closely related, and have probably gained their rust resistance from Crossbred 53, which is good in this respect.

Ford has been widely grown for some time, and its value for certain soils and climatic conditions is recognised not only in South Australia but also in the other States of the Commonwealth.

Sword has quickly jumped into prominence and is likely to prove a most valuable wheat. In the breeding plots at Roseworthy Agricultural College it yielded extremely well, and the results obtained at that institution have been confirmed since it was distributed throughout the farming areas. At the same time it possesses the advantage of being markedly rust-resistant, and this, combined with its yielding ability, renders the variety the most important new wheat in cultivation.

A surprising fact is that *Gluyas*, which has hitherto been regarded as a particularly rust-resistant variety, was badly affected. This may have been due to the mild growing conditions experienced during the winter, which led to soft, sappy growth, not typical of Gluyas, and caused it to be susceptible to attack. On the other hand, it is possible that the peculiarities of the season may have resulted in the multiplication of an unusual strain of red rust, which was able to infect Gluyas to a greater degree than those strains usually found in South Australia.

From the evidence obtained in the past year it is definitely established that Ford and Sword are the two most rust-resistant varieties in commercial cultivation to-day and should be planted in preference to any others on those areas where weather conditions conducive to red rust are regularly experienced.

YOUR CAREER

Unless you have been specially fortune favoured, the success of your career, so vital to your whole life, is going to depend primarily upon your own efforts. There may be factors over which you can have no control, therefore it is the more necessary that you seriously grapple with those you can yourself govern. Naturally, money must enter into your plans for to-morrow, but action must be taken to-day if you are to succeed.

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THE SPECIES OF BLOWFLIES IN THE ADELAIDE DISTRICT OF SOUTH AUSTRALIA AND THEIR SEASONAL OCCURRENCE.

[By J. Davidson, D.Sc. (The Waite Research Institute, University of Adelaide).]

I.—Introduction.

There is little information recorded relating to the species of blowflies occurring in South Australia. In September, 1931, a series of continuous trapping records were commenced at the Waite Institute in order to determine the important species prevalent in this district, and their relative abundance throughout the year.

I am indebted to Dr. I. M. Mackerass and Mr. G. H. Hardy for assistance with the determination of the species dealt with.

II.—Records of the Experiments.

The meteor trap was used (this trap is described in Pamphlet No. 37, Counc. Sci. Ind. Res., 1933, p. 113). It was painted black on the outside and the top was closed with a muslin bag supported by a wire framework. The flies which entered the trap collected in the muslin bag; this was removed at frequent intervals and the flies sorted out into species and counted.

Liver was used as bait. It was placed on the bottom of a kerosene tin containing a little water to keep the bait moist. A circular hole was cut out of the top of the tin over which the trap was placed.

Preliminary trials were made with traps in four situations in order to select the most suitable site for obtaining records. Two of these were selected, one trap being placed in each situation.

Trap A, situated near the sheep yards at the Waite Institute, 400ft. altitude; the yards are surrounded by trees and are close to the farm buildings. Sheep are frequently enclosed in the yards.

Trap B, situated on the slopes of the hills, about 500ft. altitude. The area surrounding this site, for a radius of about 100 yards, consists of trees and shrubs.

Commencing September 1st, 1931, until September, 1932, fresh bait was placed in each trap at intervals of three to four weeks, as shown in Tables I. and II.; approximately the same amount of liver was used each time (about 2lbs.). No special arrangements were made regarding the attractive quality of the bait during the different baiting periods, the aim of the experiment being simply to record the various species of blowflies which occur in the district and their relative abundance throughout the year. During hot periods in the summer the bait occasionally tended to dry out and lose its attractiveness before the end of the baiting period. With the exception of the period December 23rd to January 18th, however, this difficulty did not affect the main object of the experiment. There was a heat wave during the latter period, the bait dried, and relatively few flies were caught after the first two days. Owing to the high temperatures and low humidity the flies were not active, so that the low catch is partly due to the small fly population during the period. Precautions were taken to prevent flies developing from the bait and emerging into the traps.

The flies were removed from the traps on Monday, Wednesday, and Friday each week, the species being separated and counted (Table I.).

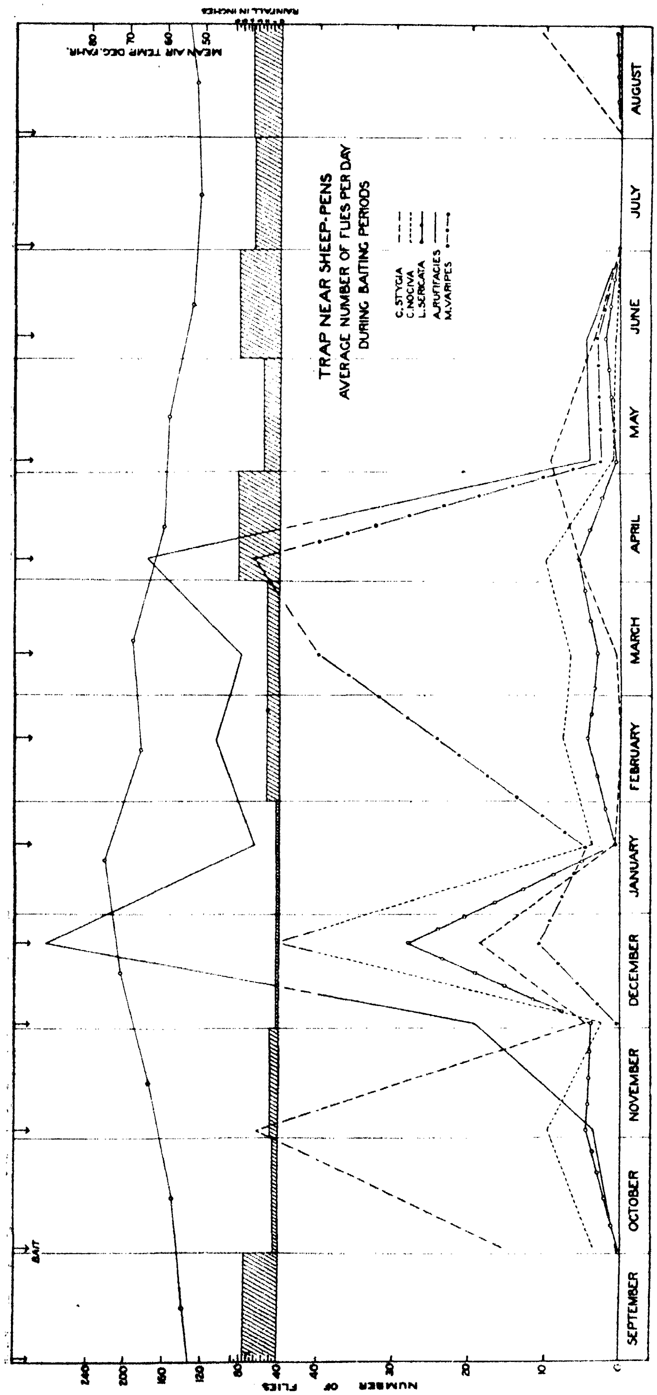

Figure 1. Showing relative abundance of the important species of blowflies recorded from one trap situated near the sheep yards at the Waite Institute during 1931-1932 together with mean monthly temperature and total monthly rainfall.

The numbers of flies for each baiting period are expressed as the average number per day. The scale is increased in the upper part of the figure.

TABLE I.—*Showing the Numbers of Five Species of Blowflies Caught in Trap A, Situated near the Sheep Yards, during the Period of Each Bait. The first Date in Column 2 is the Date the Bait was Renewed.*

No.	Period of Bait.	Number of Blowflies.					
	Dates, 1931–1932.	*L. sericata.*	*C. stygia.*	*C. nociva.*	*Ch. rufifacies.*	*M. varipes.*	Total.
1	Sept. 1–30	3	478	91	7	0	579
2	Oct. 1–Nov. 1	124	1,920	263	101	0	2,408
3	Nov. 2–30 (1)	107	137	67	553	12	876
4	Dec. 1–22	630	410	934	6,350	233	8,557
5	Dec. 23–Jan. 18 (2)	17	19	100	1,828	124	2,088
6	Jan. 19–Feb. 16 ...	132	0	226	3,213	704	4,275
7	Feb. 17–Mar. 10 ..	65	9	143	1,669	839	2,725
8	Mar. 11–April 5 ...	146	145	260	4,605	1,770	6,926
9	April 6–May 2	17	246	28	107	63	461
10	May 3–June 5	72	115	16	152	102	457
11	June 6–30	—	—	—	—	—	—
12	July 1–31	—	—	—	—	—	—
13	Aug. 1–29	2	295	2	0	0	299
		1,315	3,774	2,130	18,585	3,847	29,651

(1) Baited with mutton on Nov. 23rd as liver not available ; this was a poor bait.
(2) Hot weather, poor bait.

TABLE II.—*Showing the Numbers of Five Species of Blowflies Caught in Trap B, Situated on the Hillside.*

No.	Period of Bait.	Number of Blowflies.					
	Dates, 1931–1932.	*L. sericata.*	*C. stygia.*	*C. nociva.*	*Ch. rufifacies.*	*M. varipes.*	Total.
1	Sept. 1–30	—	34	—	—	—	34
2	Oct. 1–Nov. 1 (1) .	30	181	11	31	1	254
3	Nov. 2–30 (2)	15	348	57	458	7	885
4	Dec. 1–22	2	50	43	442	20	557
5	Dec. 23–Jan. 18 (3)	0	0	0	5	1	6
6	Jan. 19–Feb. 16 ...	2	0	59	633	309	1,003
7	Feb. 17–Mar. 10 ..	4	2	40	849	835	1,730
8	Mar. 11–April 5 ...	0	9	5	163	528	705
9	April 6–May 2	1	575	27	222	486	1,311
10	May 3–June 5	4	311	2	62	193	572
11	June 6–30	0	30	0	0	0	30
12	July 1–31	—	—	—	—	—	—
13	Aug. 1–29	0	250	6	0	0	256
		58	1,790	250	2,865	2,380	7,343

(1) Catch of Oct. 31–Nov. 2 escaped, muslin cover blown off.
(2) Rebaited with mutton on Nov. 23rd ; bait poor.
(3) Hot weather, bait dried.

It was not possible to deduce from the records any clear relationship regarding the sequence of the various species of flies attracted to the trap in relation to the age of the bait. It would be necessary to design the experiment specially for this purpose.

Certain observations which were made from time to time with different traps in various situations show that many factors are involved if a critical analysis is to be made of the number of flies caught in a trap. The factors concerned appear to be—

(*a*) The type of trap and its color.

(*b*) Its situation with reference to sunshine, shade, and wind; its proximity to places where sheep congregate and to the homestead or farm buildings.

(*c*) Weather conditions, particularly temperature and humidity, affecting the activity of the flies.

(*d*) Attractiveness of the bait.

(*e*) The fly population in the area surrounding the trap; a brood of flies emerging from an unknown temporary breeding site (casual carcass) may result in a marked increase in the number of flies at a particular time.

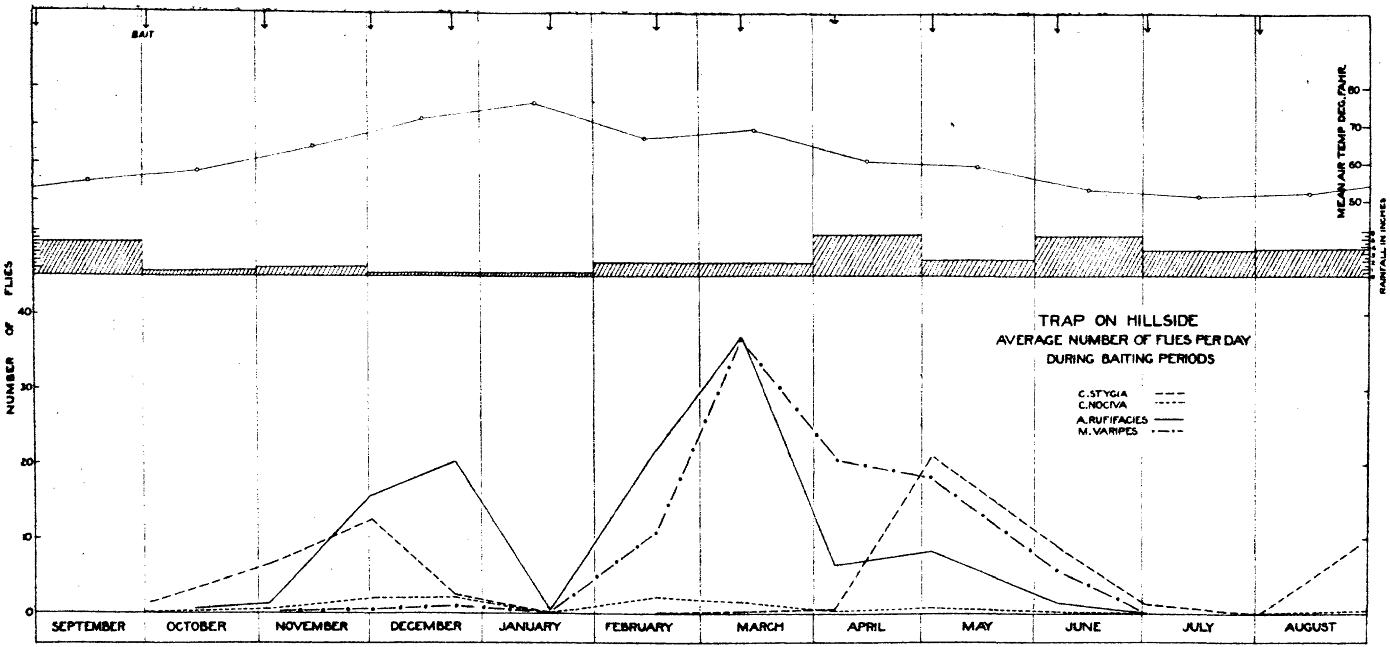

Figure 2. Showing relative abundance of species of blowflies recorded from one trap situated on the hillside near the Waite Institute during 1931-1932.

III.—The Species of Blowflies Taken in the Traps.

The important species recorded were:—The European green blowfly (*Lucilia sericata* Meigen), the large brown blowfly (*Calliphora stygia* Fab.), the lesser brown blowfly (*Calliphora nociva* Hardy), the secondary green blowfly, or hairy-maggot fly (*Chrysomyia rufifacies* Macquart), the small metallic green blowfly (*Microcalliphora varipes* Macquart). The first three species are primary flies associated with the blowing of sheep; the two remaining species are secondary flies which are considered to be attracted to blown sheep, owing largely to the condition set up by the primary flies.

(1) *Lucilia sericata* Meig.

This is the so-called European green blowfly; it is a little more than one-quarter of an inch long and has a bright metallic green color, sometimes with a bronzy sheen; the eyes are reddish in color; the middle portion of the body (thorax) bears a number of black bristles; the hind body (abdomen) tapers somewhat towards the extremity and bears a number of smaller bristle-like hairs; the legs are black. The maggot is smooth, whitish to pink in color.

It has been shown recently that in the eastern areas of Australia another species occurs (*L. cuprina* Wied.) which closely resembles *sericata,* and has doubtless been confused with it. In *L. cuprina* the thighs of the fore-legs are green; in *L. sericata* they are black. Dr. Mackerras kindly informed me in 1931 of the occurrence of *L. cuprina,* but I have not found specimens of it in the material collected in the traps; it has not been recorded from the Adelaide district.

(2) *Chrysomyia rufifacies* Macq.

This green fly somewhat resembles the previous species, but is slightly larger and stouter; it is green with a bluish tinge, particularly on the abdomen; the eyes are reddish; the thorax is not bristly as in the previous species, and the abdomen is also much less hairy; dark transverse bands cross the abdomen at the junction of the segments, giving the fly a banded appearance, by means of which it can be readily distinguished from the primary green blowfly, *L. sericata*; the legs are black; the larva is found on blown sheep, and is known as "hairy maggot," due to the characteristic protuberances over its surface; it is stouter and darker than the smooth maggot of *L. sericata.*

(3) *Microcalliphora varipes* Macq.

This green fly is smaller than the preceding species (less than half the size); it resembles *Ch. rufifacies* in color and its banded appearance; the maggot is hairy, but much smaller than that of *Ch. rufifacies.*

(4) *Calliphora stygia* Meig.

This is the large, stout, brown or golden-haired blowfly; the thorax is slaty grey; the abdomen is dark brown with fine dense golden hairs in patches on the upper surface and covering the under surface; the maggot is stout, whitish, and smooth.

Note.—In Western Australia an allied species, *C. australis* Boisd., appears to take the place of *stygia.*

(5) *Calliphora nociva* Hardy.

This species closely resembles *"augur,"* to which the name lesser brown blowfly has been applied; it was separated by Hardy in 1932 (Bull. Ent. Res. XXIII., p. 556). This author collected specimens in the Adelaide district in the summer of 1930-31. The material collected from the traps was originally classified as *C. augur* (not typical), and I have now adopted Mr. Hardy's placing.

C. nociva is somewhat smaller than *stygia*; the abdomen has a vivid blue area on the upper surface, and the lower surface does not possess the covering of golden hairs found in *stygia*.

One feature of difference between *augur* and *nociva* given by Hardy is—(*a*) *augur* has the abdominal stripe blue-green with the portion on the fourth tergite, sometimes quite concealed by a yellow pulverulent covering; (*b*) *nociva* has the abdominal stripe vivid blue, and the portion on the fourth tergite is never concealed, although covered with a silvery or ashy-white pulverulent overlay.

Two further species of *Calliphora* were recorded, *C. fulvicoxa* Hardy and *C. tibialis* Macq. Certain other forms of *Calliphora* which appear to belong to the *hilli, rufipes* complex were not placed. The small black tertiary fly, *Peronia rostrata*, R-D. was taken in large numbers.

Calliphora fulvicoxa Hardy.

This species was described in 1930 by Hardy (Bull. Ent. Res. XXI., p. 445), who collected specimens near Adelaide in January, 1931.

Calliphora tibialis Macq.

This species, as defined by Hardy (Bull. Ent. Res. XXI., 1930, p. 549), has also been recorded; it frequents hedges.

IV.—THE OCCURRENCE OF THE DIFFERENT SPECIES OF BLOWFLIES THROUGHOUT THE YEAR.

The relative abundance of the various species in the different months is shown in Figs. 1 and 2. Each point on the different curves represents the number of individuals caught during each baiting period, being expressed as the average number per day for the period concerned; the point is placed at the end of the baiting period. (The total numbers for each species is given in Tables I. and II.). In Fig. 1 it was necessary to increase the scale in the upper portion of the figure, in order to keep it to reasonable proportions, owing particularly to the large numbers of *C. rufifacies* which were recorded. The numbers of flies caught in Trap A greatly exceeded those in Trap B, which indicates the greater blowfly population attracted to the area round the sheep yards. The numbers of *L. sericata* recorded from Trap B were too small to allow of their being shown in Fig. 2.

The marked depression in the numbers in the baiting period, December 23rd to January 18th, is associated with the weak attractive quality of the bait and the high temperatures and low humidity during the great part of this period.

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REPORT ON THE DISTRIBUTION, MIGRATORY MOVEMENTS, AND CONTROL OF THE STARLING (*STURNUS VULGARIS*) IN AUSTRALIA.

[By J. P. KINGHORN, C.M.Z.S., Australian Museum.]

INTRODUCTION.

The investigations on which this report is based arose from an inquiry from settlers on the Murrumbidgee Irrigation Area regarding the movements, habits, and means of control of the starling. This was forwarded to me for a recommendation, but it was found that before any detailed economic work could be carried out in this country it would be necessary to learn something concerning the general disposition of the bird, the possible cause of its nomadic habits, the effect (if any) of climatic and general weather conditions, and at the same time to seek opinions from reliable persons in agricultural districts concerning food available to or eaten by the bird.

A questionaire in card form was drawn up and submitted by the Under-Secretary for Agriculture, New South Wales, to a Conference of Ministers of Agriculture held at Melbourne in 1929, where the co-operation of all the States of the Commonwealth was assured, and eventually the cards were forwarded to Agricultural Inspectors throughout Australia. The card contained the following questions:—

State.
District.
Date.
Principal crops of fruit and stage of development.
Are starlings in large flocks (1,000's), small flocks (100 or less), or only in scattered pairs, &c.?
Do they damage any particular fruit, and, if so, which?
Is the season wet or dry, &c.?
Remarks on breeding, &c.

Each officer received 12 cards, and was required to return one each month throughout the year, commencing in January and ending December, 1931, and it was hoped that from these cards much valuable information would be gained. Unfortunately, only about 75 per cent. of the total number of cards were returned, and, while some gave very full and interesting details, it was evident in others that no great trouble has been taken to look for starlings, the birds being reported as not occurring in the district, when independent inquiries made by me from local bird observers revealed that they were resident in the district, and even in the town, in scattered pairs.

One of the most interesting reports came from North Queensland, but I learnt later that the bird referred to was the Australian shining starling (*Calornis metallica*) and not the introduced starling (*Sturnus vulgaris*). Mention is made of this in that section of the report dealing with the distribution.

Although this report was well advanced early in the year 1932, the somewhat contradictory evidence contained on some of the cards made it necessary for me to write to members of the Royal Australasian Ornithologists' Union and other observers resident in various localities in western New South Wales, the southern parts of Central Australia, west Eyre's Peninsula, the Transcontinental railway line, and Queensland before I could continue. While the evidence for or against the starling is not as conclusive as it might have been had a systematic examination of stomach contents been made, it gives a fairly accurate indication as to the distribution of the bird, and it should be a valuable foundation for a future investigation regarding its economic value.

SOME EARLY HISTORY.

The starling was introduced into Victoria by the Zoological and Acclimatisation Society in the year 1862, and within a few years numbers had been liberated at various places in that State. It was stated at the time that "it was hoped the starling, in common with other imported birds, would be introduced in sufficient numbers to ensure its permanence." By the time the society had been in force for 36 years, the opinion of the members was that "whilst in England the starling was mainly insectivorous, it had become a stealer and eater of fruit in Victoria and Tasmania." It was also reported that it had increased in numbers and spread over a large area of country.

One of the earliest records relating to the introduction and acclimatisation of the starling in New South Wales is in a report made to the Zoological Society in 1863, to the effect that it had built in the eaves of the cottage belonging to Mr. C. Robinson, at Ashfield, and had reared two broods of young birds, and it was thought that the parent birds were most probably those introduced by the society and liberated by Mr. Arthur T. Holroyde on his estate at Sherwood Scrubs in the year 1860.

An occasional reference in later years suggested that the bird was fast becoming widely distributed throughout the eastern part of New South Wales, whilst a writer in the "Pastoral Review" in 1914 noted that it had extended to the Manaro district and a great part of the Riverina, well up the north coast, and out west as far as Mudgee.

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The species was introduced into Queensland in May, 1869, when a few birds were taken to that State in the ship *Flying Cloud,* but as nothing was seen of them after their liberation it was assumed that they had not survived. It is not known, therefore, whether the birds which have become acclimatised, and have spread over parts of Queensland, are the offspring of those introduced in 1869, or are birds which have spread northwards from New South Wales. There is no record of a separate introduction into South Australia, probably the Victorian overflow spread into that State. There are records of fairly early introductions of starlings to some of the islands of Bass Strait, but possibly the Tasmanian birds were taken across from Victoria.

PRESENT DISTRIBUTION IN AUSTRALIA.

Records to hand show that the starling is distributed over almost the whole of the cultivated lands of South-eastern Australia. Small flocks have travelled west along the Transcontinental railway as far as Ooldea, and for about 300 miles north of Adelaide, in South Australia. While they appear in the south-western corner of Eyre's Peninsula, apparently they have not yet found their way far along the coast line of the Great Australian Bight.

They extend eastwards from South Australia to Broken Hill, in New South Wales; then south, covering the whole of Victoria, Tasmania, and the eastern half of New South Wales; only a few scattered rather small colonies being known along the great western railway to Bourke and along the Darling River; otherwise the whole of the drier interior of New South Wales is devoid of starlings.

In Queensland the bird is restricted to the south-eastern corner, finding its way out to Roma district and north along the coast to a point somewhere midway between Brisbane and Rockhampton. The exact northern limit is not definitely known, but it has not yet crossed the Tropic of Capricorn.

There were several reports concerning large numbers of starlings at Cairns and Townsville, and it appeared at first that either some wanderers became isolated and had bred, or that a separate introduction had been made at Cairns at some time or other. Further inquiries from members of the Ornithologists' Union elicited the fact that the birds spoken of were Australian shining starlings (*Calornis metallica*) and not the introduced starling (*Sturnus vulgaris*).

CLIMATIC BARRIERS.

Apparently the starling prefers cold or temperate climates, more particularly those parts where there is a rainfall above the average, as the returns show that it is resident throughout the whole year in enormous numbers in Tasmania and southern and south-eastern Victoria, and in some coastal districts in New South Wales and Queensland. The further inland the more nomadic is it in its habits, though in the drier areas it is only an occasional visitor. It would appear that dry, hot climates do not suit the bird or its requirements, and that such places will never be invaded by the enormous flocks of the south-eastern portion of the continent.

STARLING AND MIGRATION.

Though the starling "flocks" at certain times, when many thousands might suddenly appear in, or leave a district, it is not strictly migratory, and does not leave Australia for other parts. It is, however, nomadic, and apparently erratic, following no definite course, but usually timing it's wanderings to arrive in a district when the fruit is ripening, or when grasshopper and other insect plagues are prevalent, while it is, to a certain extent, affected by weather conditions.

It has not been possible, from information received, to arrive at any conclusion regarding the movements of the starling in Australia.

REPORTS FROM SOUTH AUSTRALIA.

During the year 1931 starlings were reported as being not so numerous as the previous year. The weather generally was drier, except for mid-winter and the last quarter, but there is no indication that the weather conditions affected the numbers of bird visitors, though apparently it had some influence on the kind of food eaten. Soft fruits of all kinds were attacked, but, with the exception of Roseworthy district, the damage done was not regarded as very serious.

In the Lower North the flocks were at their greatest during February and March at Roseworthy, but they apparently moved to Riverton in April or May. In the former locality very large flocks congregated during June and July in the agricultural districts and were reported as being insectivorous. In and around Riverton the pea grub was attacked during December, 1930, while grapes and figs attracted the attention of the birds in January, February, and March, 1931. The flocks then moved to pasture lands, where they were regarded as insectivorous. In the north the weather was dry until July, when cherries, apricots, and, later, apples were attacked, but for the remainder of the year the bird appeared to be mainly insectivorous.

In Adelaide and surrounding country the starlings, though numerous, were not in such large flocks as further east, and their diet was reported to consist of fruit and insects. In the Mount Lofty area considerable damage was done to all fruits in season. At Veitch, in the north Murray Valley, very few birds were present during January and February, but in March large flocks appeared; the weather was dry, and the birds fed in pasture lands, apparently seeking insects. In the Murray Valley the birds were reported as being in large flocks the whole year through, but they were regarded as insectivorous and entirely beneficial. In the Eden Valley flocks of 100 and upwards were present throughout the year, even in January when the temperature was round and about 100 degrees, and later when it was cold and wet. All soft fruits were damaged, but during the month of November the birds turned their attention to a plague of caterpillars. Currants and olives were reported as being attacked in several localities. In the south-eastern corner of the State large numbers of starlings were present during the dry weather in January, February, and March, but disappeared before or during the April rains. In June they returned in large flocks to feed on pasture lands, but none were seen in the district from July until late September, the weather varying from dry to rainy.

In the upper and lower Eyre's Peninsula no fruit is grown for commercial purposes, the area being mainly an agricultural one. The starlings varied in numbers, moving about from place to place somewhat disconcertingly; no comments were made regarding their economic importance. Inquiries made at Ceduna, in the western portion of Eyre's Peninsula, brought the reply that starlings were

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very rare visitors to that district, but that there were a few resident birds on a small island 40 miles south. On Kangaroo Island they are resident and very plentiful, and damage cherries, grapes, and apricots, but also destroy many kinds of insects. They are occasional visitors to Ooldea, a fact that was verified in February, 1932. They should be destroyed on sight at this station, or they might gradually extend along the Transcontinental railway to Western Australia, in which State they are at present unknown. Marree observers stated that starlings had never been known to go so far north, and that about 200 miles south was their limit. This limit is somewhat near the border of the Upper North agricultural district.

There is no doubt in my mind that starlings which occur at Broken Hill, New South Wales, reached that locality from South Australia, by following the various homesteads along or near the railway line.

ATTITUDE OF STARLING TO OTHER BIRDS.

The Starling adopts a most antagonistic attitude to the native birds, and not only are its tactics irritating, but it persistently drives away many of our more valuable insectivorous species, and takes possession of all available nesting sites. This is more noticeable in timbered country, where it claims most of the hollow limbs and holes in trees that otherwise would be occupied by other birds. It appears to be a natural aggressor, for even when there are plenty of nesting sites for all, it almost invariably prefers those places occupied by other species. Furthermore, it has been observed to alight in a tree where smaller insectivorous birds are feeding and drive them away.

ERADICATION OR CONTROL.

The starling is so firmly established in south-eastern Australia that it's total eradication is quite beyond hope, but it can be controlled to a certain extent under favorable conditions. Some of the people who suffer through having their fruit trees attacked make some attempt to drive the birds away, but make no move towards destroying nests in sheds and in the eaves of houses. Everything possible should be done to prevent starlings from nesting in such places, by placing wire netting or boards over all cavities which might be used for nests. Nesting pairs should be shot, trapped, or poisoned, though the wholesale use of poison baits is not recommended unless the user can be certain that the bait is of such a nature, or so placed, that it will not be taken by other species of birds.

An example of the wholesale poisoning of useful birds can be seen almost anywhere in the country where poison for rabbits is carelessly deposited.

Trapping is not very satisfactory, though with continual trapping in orchards and small holdings a substantial number of birds would be destroyed. Many kinds of simple netting traps have been tried, and an ordinary frame covered with ½in. or 1in. wire netting, or a screen ash-sifter, propped up and baited underneath, then set off with a string or trigger, has been found useful. In places where large numbers of starlings roost they can be driven away by the firing of guns just before darkness sets in and before the birds have settled down for the night. After such roosts have been attacked for three or four consecutive nights the starlings will probably leave the district. Though the starling is pugnacious in its attitude towards other birds, it is timid towards man, and where it is doing damage in orchards can be frightened by gunfire. The frequent and systematic use of the shot gun has, in some cases, effectively prevented starlings from entering orchards, while in others it has completely driven them away.

The payment of a bounty on heads and eggs should encourage the younger members of the community to take action, and thousands of birds or their eggs should be destroyed during the breeding season.

A search through literature has failed to produce results, and apparently there is no known method of complete control of the starling.

A REVIEW OF SOME OF THE CRUCIFEROUS WEEDS OCCURRING IN SOUTH AUSTRALIA, WITH PARTICULAR REFERENCE TO THE LOWER NORTH.

[By WORSLEY C. JOHNSTON, R.D.A., Agricultural Instructor.]

INTRODUCTION.

The botanical family of *Cruciferae* is of world-wide distribution, represented in South Australia by 73 species which, according to Black[1], fall into 21 genera. Of the 63 species, 44 are indigenous and the remaining 19 are introduced.

The family is estimated to contain upwards of 2,000 species in 180 genera, many of which are important economic plants, whilst others are weeds. Of the former, possibly the Cabbage (*B. oleracea L. var. capitata*) is the most important, while Cauliflower, Turnips, Rape, and Mustard play an important part in the economic life of many people and are too well known to come under the scope of this paper.

It is expressly with the weeds that this paper deals, and it is hoped to offer some guidance as to the importance or otherwise of the individual species, together with notes on their distribution, economic importance, control, and easy means of identification. In this latter direction every effort has been made to eliminate the use of botanical phraseology, as it is realised that to those who appreciate such terms much more appropriate works than this paper are available. It is, of course, recognised that in striving to attain this object some clarity of description is lost, but it is hoped to compensate for this loss by the addition of figures illustrating each plant.

The paper is undertaken with the intention of assisting to clear up much confusion that exists as to the different species, for it is almost invariably found that the species have become greatly confused in the minds of our agriculturists.

Some of the possible means of introduction of weeds are also discussed, but it is fully realised that many more possible avenues exist whereby weeds gain access to farms and the country.

THE DISTRIBUTION OF WEEDS.

The greatest agency for the distribution of weeds in modern times is, undoubtedly, man himself, either directly or by the aid of rapid means of transport and the shifting of large volumes of goods from one country to another or from one part of the State to another.

The weeds under discussion are not greatly fitted for distribution by natural agencies so that within small limits all further spread is carried out by man or some of his agencies.

The following may be summarised as the chief means by which such an end is brought about:—(1) The purchase or change of seed. (2) The purchase of fodder. (3) The agency of stock; and (4) The Transportation of goods.

Under the natural agencies of distribution may be considered the effects of (*a*) wind and (*b*) water.

(1) *The Purchase or Change of Seed.*

The lack of supervision in the purchase or exchange of seed from one district to another can often prove to be a very fruitful means of introducing new weeds. The danger is further aggravated where such introduced seed is sown without being graded or carefully examined. Several instances of farmers having purchased seed from a distant part which, upon inspection, contained the seeds of bad agricultural weeds have come under the notice of the writer.

The practice, fortunately losing favor, but which was carried on extensively at one time, of obtaining extensive supplies of seeds from an outside district, and sometimes at great inconvenience and cost, is one beset with grave possibilities in this direction. It was held that such a change gave better crops, but more detailed observation has shown that promiscuous changes in this way are of no benefit. It must not be assumed, however, that the purchase of a new variety from a recognised souce is discouraged.

Although every effort is made by the producers of most garden seeds not to supply impurities, there is always a risk of bad weeds being introduced through such a medium.

Realising the danger of uncertified seed, great care should be taken in its purchase, and equal care should be exercised to see that it is graded before planting. Should foreign, suspicious seeds be found it would be wise to refrain from planting such seed rather than risk contaminating the land with additional weeds.

The fact that any seed purchased can be a means of introducing, as impurities, useless plants must never be lost sight of, and it would be wise to keep a critical look-out for suspicious plants growing in a crop from such seed. If any specimens are found they are best pulled and burned.

(2) *The Purchase of Fodder.*

The practice of obtaining fodder from other districts, and which is unhappily forced upon many districts in time of drought, is always one beset with potential dangers in the matter of weed introduction. It is usual, in years when these periods of drought occur, to find that weeds are much more in evidence, and although it is usual to cut a crop for hay on the green side it is seldom cut at a stage at which none of the seeds of the weeds contained therein are not likely to germinate. Such being the position, when a crop is sold for hay and is transported as chaff for a considerable distance to be fed to either horses or cattle, it is only to be expected that many seedlings are likely to appear after passing through the animals.

It has been observed, in several instances, that where a crop containing bad weeds has been cut as hay, sold to a chaff mill, cut into chaff, and distributed to a number of districts, clean areas have thus become exposed to the infection of a bad weed.

The use of whole grain—purchased from an unknown source of production—as horse feed is not only wasteful, but it is apt to be a means by which undesirable plants can be introduced. This danger can, of course, be obviated by the crushing of all grain which is to be fed to animals and which is not home grown.

(3) *The Agency of Stock.*

Travelling animals are a danger in the distribution of weeds, but this risk is never very serious. The greater danger would be in the transportation of animals by railway over relatively short distances. In this regard horses would offer the greatest danger, cattle slightly less, while with sheep the chance would be greatly reduced and almost confined to such weeds as Bathurst Burr, which would cling to the wool. Realising this danger it is the practice to examine rams carefully for such weeds before taking them from an infested area to a clean one.

(4) *The Transportation of Goods.*

There is a grave danger in this direction, and as our railways are the main conveyors of goods we see evidence of the spread of weeds along the rail reserves. Frequently we find that the first record of the appearance of an introduced weed is in or near some seaport from whence it spreads along the permanent ways leading inland. Such a state of things is to be expected when it is realised that many sorts of goods are packed in straw which, undoubtedly, contains odd seeds of some plants. The goods with their packing are often transported by rail to some distant part, and in the course of transit vibration and handling allow the seeds to escape on to the soil, where they eventually germinate and, if conditions are suitable, establish themselves and spread to the adjoining fields.

In our own conditions we can often see similar dissemination of weeds occurring. In districts where, say, Wild Turnip is prevalent, much ripe viable seed is gathered with the wheat and delivered to the railway siding. In the course of loading operations a bag is often split, thus allowing much wheat and some of the impurities to be scattered on the floor of the truck. In the course of transit, gravity and vibration work much of the mixture out of the truck to be thrown on the side of the line where the weed soon becomes established. This fact is very significant when a weed survey is made along the railways leading out of such a district, for it is always found that any such weed is spreading along these routes. This means of distribution of obnoxious weeds is very hard to combat, and can only be checked by careful supervision of all railway reserves.

Natural Agencies.

(*a*) *Wind.*—The mechanical action of wind is a common method of weed distribution, although possibly not of very great importance with the plants under consideration. Even with these, however, the action of rolling the dried stalks containing the ripe seeds of Wild Turnip or Dog Mustard can be important means of spread. It should be realised that with Cruciferous weeds the main danger lies with the species which contain seeds in a non-splitting pod. As there are only two of such weeds discussed so the action of wind cannot be considered very serious, apart from heavy dust storms and the like carrying light seeds with them.

(*b*) *Water.*—The onrush of floodwaters carry great quantities of vegetable litter from their source to their termination, distributing much of it *en route*. With many of the creeks throughout South Australia they generally extend over flood plains, so that any seeds collected on the way are deposited not only along the banks but over these plains.

Many of the most severe floods occur through thunderstorms in the summer after most plants have matured their seeds, so that when the flood comes it takes great quantities of these seeds and deposits them along its entire course.

Many instances are known of a plant having made its appearance at the source of a creek and being soon found lower down-stream.

SOME GENERAL HINTS FOR IDENTIFICATION OF CRUCIFEROUS PLANTS.

Without resorting to extensive botanical descriptions, it is hoped to offer some details by which a layman can recognise a cruciferous plant; it being fully realised that such an effort can only be approximate.

The flowers and seed pods are the most important features by which all plants are recognised. The special features of this order lie chiefly in the flower parts, for the pods show considerable variation as to size, shape, and number of seeds they contain. With the flower, however, it contains four sepals, four petals, six stamens, four of which are longer than the other two, and a terminal stigma. The arrangement of the petals so as to suggest a cross gave rise to the family name.

With one exception amongst the undermentioned weeds there appears a general resemblance in the manner of flowering in so far as the branch bearing the flowers continues to extend its length for a considerable distance. In effect this means that there are pods with almost mature seeds near its base, and opening flowers at its tip. The exception to this general rule is with Hoary Cress, where the flowers open in such a way as to suggest a cauliflower head.

The pods offer great differences in length, shape, and the number of seeds they contain, but generally they are divided into two chambers with a thin parchment-like partition between them. The pod generally splits by two valves coming away from the central partition so as to leave this section adhering to the main stem. Exceptions to this rule are found in Wild Turnip, Dog Mustard, and Wild Radish.

The leaves exhibit great variation in shape, but they usually have an odour resembling cabbage if crushed, and if masticated a hot sensation similar to that of mustard is felt. The seeds almost invariably give this mustard-like taste if chewed.

The plants under review are:—

Sisymbrium officinale. L.	Hedge Mustard.
Sisymbrium erysimoides. Desf.	Smooth Mustard.
Sisymbrium Irio. L.	London Rocket.
Sisymbrium orientale. L.	Wild Mustard.
Brassica Sinapistrum. Boiss.	Charlock.
Brassica adpressa. Boiss.	Buchan Weed.
Diplotaxis tenuifolia. (L.) D.C.	Perennial Rocket or Lincoln Weed.
Diplotaxis muralis. (L.) D.C.	Sand Rocket.
Lepidium Draba. L.	Hoary Cress.
Capsella Bursa-pastoris. (L.) Moench. . .	Shepherds Purse.
Rapistrum rugosum. All.	Wild Turnip.
Raphanus Raphanistrum. L.	Wild Radish.
Myagrum perfoliatum. L.	Dog Mustard.
Carrichtera annua. (L.) Prantl.	
Neslia paniculata	Ball Mustard.

Their Value as Feed.

As stock foods many plants belonging to this order are greatly prized and are of great economic importance. The cultivation of Turnips, Kale, Rape, &c., are operations of no mean importance in the agriculture of many countries.

All plants of this order can cause digestive trouble in domesticated stock if not fed with care and judgment, but the danger of causing serious trouble is not very great unless animals are supplied with large quantities of the herbage in flower or seed. It is well known that mustard acts both as an irritant and emetic, and its properties are often utilised for the benefit of man. All of the species contain these properties of mustard in varying degrees.

Pammel[2] gives Shepherds Purse, Lincoln Weed, Wild Radish, and Charlock as containing irritant properties, and also that Hoary Cress is used for the extraction of a fish poison.

Long[3] states Charlock is poisonous to livestock only if eaten in large quantities when in flower, and that the seeds if eaten in quantities are poisonous; the toxic principles being Oil of Mustard.

It will be understood that in an ordinary way the plants are not likely to cause trouble to livestock. Under average conditions sheep will graze most of the plants above-mentioned, although they show very little appreciation for either Ball Mustard, Hoary Cress, Carrichtera, or Shepherds Purse.

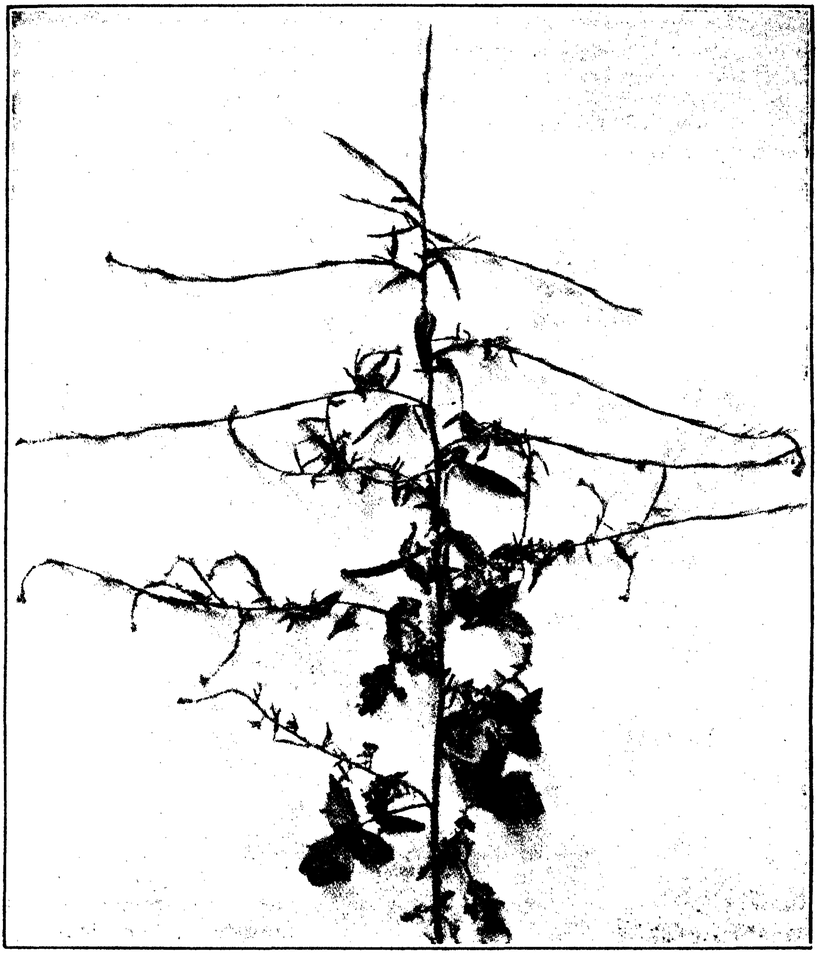
Of the others which exhibit varying degrees of palatability, Wild Mustard, Smooth Mustard, and Wild Turnip are often grazed quite freely. Occasionally reports are made of sheep grazing Hoary Cress, but it seems necessary for large quantities of other herbage to be present before this occurs.

Discussion often arises as to the value of Sand Rocket and Lincoln Weed, it being at times contended that sheep will feed them and give quite satisfactory results, but observation has shown that in the height of summer, when green feed is very scarce, sheep will graze these plants, but only after all other green feed has been devoured.

Varied opinions exist regarding the value of Dog Mustard, but in a general way it does not appear to be palatable to livestock. London Rocket has not, so far, become widely distributed; in fact no specimens have been found under field conditions, but as it resembles very closely Wild Mustard there is no reason to suppose it will be less palatable to stock. The seeds of London Rocket are supposed to contain medicinal properties. In the Dictionary of the Economic Products of

India, vol. VI., page 224, it is stated "that the seeds of this plant are used by the Mahommedans, internally as an expectorant and stimulant and as a stimulating external poultice."

It has been contended that cruciferous weeds need not be viewed with any great concern as they are freely eaten by stock. While this can be said of some of them, it cannot apply to many others.



Sisymbrium officinale. (L.) (Hedge Mustard.)

Sisymbrium officinale. *Hedge Mustard.*

Description.—This is a slightly hairy, upright, vigorous annual often reaching a height of 5ft.; the lower leaves are stalked and much toothed; the leaf tissue at the base of each tooth is turned upwards; the uppermost lobe of the leaf is rounded; the stem leaves are also stalked, but the terminal lobe is connected to the next lower one on each side, thus giving it an arrow-head effect; flowering branches are much divided; flowers small and yellow; seed pod short, about ⅝in.

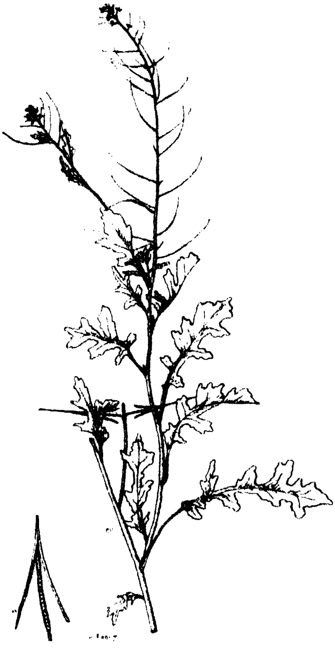
long and ⅛in. in diameter, awl-like in shape and closely pressed to the flowering branch; the seeds minute, yellowish, and attached to each side of the central partition. Flowering generally occurs in the spring.

Origin.—This is an Old World species, now found in all temperate parts of the globe.

Localities Where Found.—This plant has established itself almost throughout the State.

Its Agricultural Importance.—As the vernacular name would suggest, it prefers sheltered, uncultivated situations such as would occur near hedges, in the Old World, or near buildings, woodheaps, &c., in Australia.

In countries where cruciferous crops are of importance this weed causes trouble by its ability to act as a carry-over host plant for insect and fungous pests. Under the bulk of Australian conditions the plant is not very serious, only becoming prevalent in such sheltered positions as above-mentioned. Occasionally, however, it makes its appearance in crops, but only as isolated plants, where its deep-rooted habit and tough stem allow it to be drawn through the comb of a reaping machine, thus causing little trouble. In hay crops it is a disadvantage as its coarse, fibrous nature does not produce good feed.



Sisymbrium erysimoides. Desf. (Smooth Mustard.)

In pastures the plant is kept well under by animals, as they exhibit a liking for it. It is never found seeding in localities where stock have access.

It is a very free seeder, and in this respect Long[4] describes it as producing upwards of 4,000 seeds per plant. The seed is long lived and will remain for years for favorable conditions to germinate.

Control.—Should be carried out primarily to prevent the plant seeding. This can be achieved by careful cultivation in arable land, and by the judicious use of grazing animals. Hand cutting or pulling must be resorted to in situations where these methods cannot be availed of.

Soils Suitable.—The plant shows a preference for good, heavy, rich soils, but may be found on almost all classes of soil in suitable situations.

Sisymbrium erysimoides. *Smooth Mustard.*

Description.—A smooth, hairless, light-green annual, of erect habit, at times reaching a height of 3-4ft.; leaves stalked and deeply toothed, the terminal lobe being much larger than the others; flowering branches much divided, each branch being terminated by a cluster of small yellow flowers; the stalk carrying the pod is short and thick; pods long and slender, from 1-2in. in length and about 1/16in. in diameter, spreading away from the flowering branch; seeds very fine, of a reddish-brown color when ripe, carried on either side of a central partition. Flowers appear in the early spring or late autumn and continue until the early summer.

Origin.—The natural habitat of this species appears to be Spain.

Localities where Found.—This species has established itself along the railways along the north of Owen, and may be obtained in quantities at Owen and Balaklava, Kadina and Bute. It is further recorded by Black[1] from Quorn, Hawker, and Port Augusta.

Its Agricultural Importance.—So far it has not proved a very serious weed, for wherever observed it is confined to unworked land in situations protected from livestock, such as railway yards, roadsides in towns, and about farm steadings. Careful observation and inquiry in the district where this weed is established has failed to evince any occurrence of the plant on cropping or grazing land, and the readiness with which animals graze it does not indicate that it is becoming a dangerous weed.

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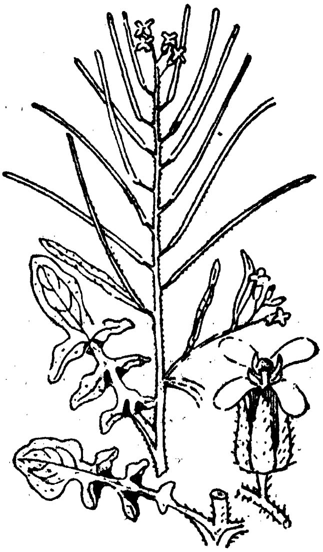
Control.—From the foregoing remarks it would seem evident that no very special effort is necessary to cope with this plant.

Soils Favored.—Experience up to date indicates that land of a calcareous nature is most suitable. It does well on light sands, but prefers a light loam to heavier types of soil.

Sisymbrium orientale. *Wild Mustard.*

(Other names applied: Oriental Rocket, Charlock.)

Description.—A slightly hairy annual, of varied habit of growth, sometimes attaining a height of 3ft.; all leaves are stalked and deeply toothed; the basal portion of each division has a triangular shaped piece of leaf-tissue rising from its base; the terminal lobe is often connected to the first lobe on each side so as to give an arrow-like effect; the flowering branches are much divided and spreading; the flowers are small and of yellow color; the fruiting stalk is short and thick, carrying a long, thin pod often over 2in. long and about ⅛in. in diameter; the pod spreads away from the branch; seeds are very fine and very numerous, produced on either side of the central partition. Flowers may be found at almost any period of the year but occur in greatest abundance in the spring, which period is the normal flowering time.



Sisymbrium orientale. (L.) (Wild Mustard.)

Origin.—The plant is of Mediterranean origin, but has become established in most countries.

Localities where Found.—It is by far the most widely distributed of these weeds within the State and is also known in almost all parts of Australia.

Its Agricultural Importance.—Its free seeding habit, coupled with its wide distribution, make it one of the weeds of agricultural importance, for if not checked it would soon become the dominant species in both crops and pasture. In some localities it is regarded as a breeder and carrier from one season to another of certain fungous diseases. Under our average cereal growing conditions, in which efficient fallowing and seeding operations have been practised, the prevalence of large quantities of this weed in a crop may be taken to indicate the ravages of some disease affecting the crop, or that the land has been overworked on a rotation far too narrow and is becoming cereal sick. Expressed differently, this plant seldom causes trouble in crops grown on well-prepared fallows on an efficiently worked farm. Cereal crops sown at the correct time and on well-prepared land will invariably compete satisfactorily with this species.

If through any disease or mistake in management the weed becomes very thick in a cereal crop it causes damage, firstly by competing with the cereal and secondly by causing mechanical blockages in the comb of the reaping machine. The latter not only cause loss of time, but also much loss of grain. In hay crops it lowers the feeding value of the resultant chaff by reason of adulteration with its thick, woody, fibrous stems, together with loss of efficiency of the binding and chaff-cutting machinery.

The plant is seen to produce its worst effects on fields which are continually subjected to a rotation of bare fallow-wheat.

In pasture, either sown or natural, it cannot be regarded detrimentally, or only in so far as it may be competing with something better. But under many farm conditions in light land, this plant makes quick, early, and palatable feed for livestock.

In a general way the occurrence of this species often necessitates the working of fallows when they would otherwise be left, so indirectly bringing about a better tilth of the land.

Control.—Its control is mainly achieved by doing everything possible to create the best conditions for the cereal crop. Carefully planned rotations, with adequate grazing will do much to keep it within bounds. It is evident that with a bare fallow-wheat rotation the plant is given every opportunity to increase the quantities of seed in the soil, and in spite of the thousands killed during each fallowing, many thousands will germinate to compete with the wheat. Should conditions be unfavorable the weeds will soon take control. On the other hand, by a more widely spaced rotation much greater opportunities are available for the destruction of the pest.

The careful preparation of fallow and its adequate working coupled with rotation will always be the most efficient means at our disposal for the control of weeds. It should be remembered, while carrying out such operations, that the use of harrows while seedlings are small will often achieve more than a cultivator when they become established. Every effort should be made to compact the fallow so as to establish a firm seedbed so essential to the rapid and vigorous growth of cereals which will by the intensity of their competition choke out any Wild Mustard that may be present.

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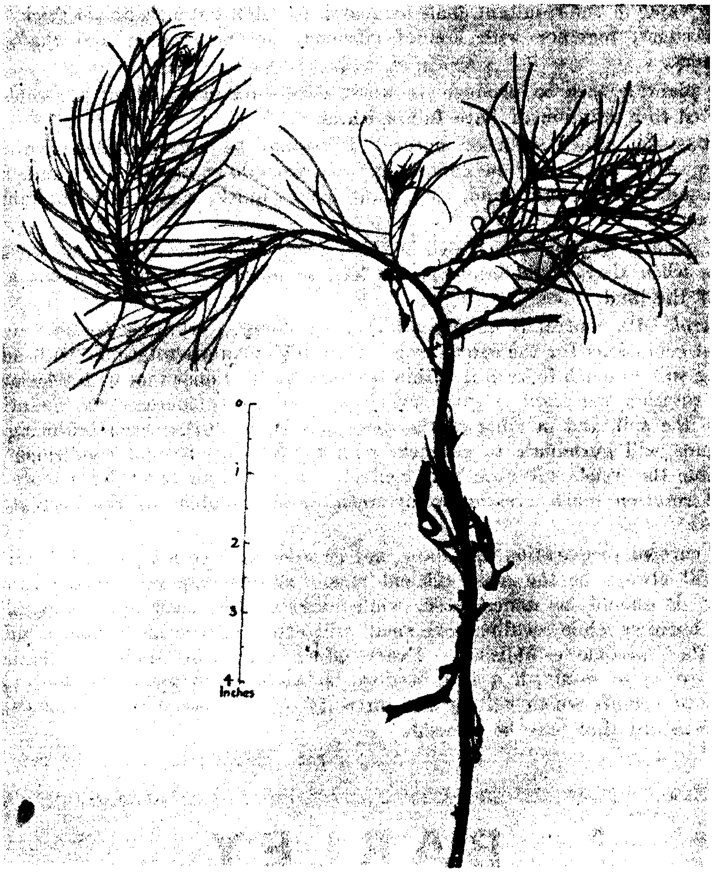
At seeding a great deal can be done to control this weed by the judicious cultivation of the soil after the opening rains and before seedlings have established themselves. Usually at this period the soil is warm and seeds germinate quickly, so that any such working should not be greatly delayed.

Soils Favored.—Although the plant thrives on a wider range of soil types it generally shows preference to those of a light nature. Calcareous soils are, perhaps, the most suitable, although sands are almost as suitable. The heavier types of soils are by no means so favorable.



Sisymbrium Irio (London Rocket.)

Sisymbrium Irio.* *London Rocket.*

Description.—This is an annual very similar to the preceding variety in its leaves, habit of growth, &c.; the chief difference is in the seed pods, which are longer and more numerous in this variety; the pods are so numerous on the branch as to give it an almost feathery appearance; seeds are very small and numerous; flowers are small and of a yellow color. Flowering occurs in the spring and early summer.

*A printer's error occurred in naming this plant "trio" in *Journal of Agriculture*, February, 1932, pages 793 and 795.

Origin.—This plant appears to be of Eastern European origin, but was called London Rocket because it sprang up in profusion amongst the ruins after the Great Fire in 1666.

Localities where Found.—Up to date this species appears to be localised to a few hundred yards from the Owen railway siding, and nowhere else in Australia.

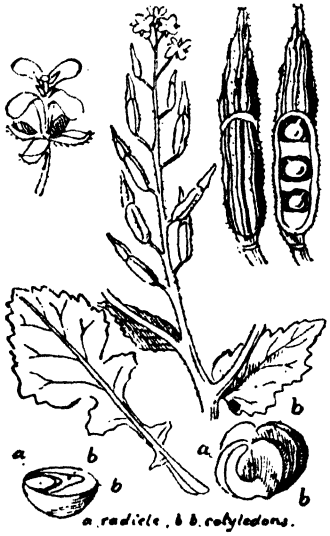
Its Agricultural Importance.—According to the literature of other countries this plant is not regarded as very serious, and as far as can be ascertained in the locality where it is present there does not appear to be very much to fear from it.

Control.—Its similarity to Wild Mustard leads one to assume that the same methods would apply to its control as are practised with Wild Mustard.

Brassica Sinapistrum. *Charlock.*

(Other names applied: Kedlock, Shellock, Yellow Weed, Wild Mustard.)

Description.—The plant is a much branched, free growing, slightly hairy annual of up to 6ft. in height; base leaves stalked and coarsely toothed, the upper lobe being the largest; stem leaves are stalkless and toothed; flowers are bright-yellow, produced in masses, so making the plant distinct amongst vegetation; the ripe pods are borne on a short stalk and are considerably longer than broad, about ¾-1½in. long by ⅛-¼in. in diameter, the top third of the pod is solid, from 6-16 seeds occur, carried on either side of the central partition; the pod is carried so as to stand well away from the flowering branch; the seeds are small, dark colored, similar to those of cabbage, &c. Flowering occurs in the early spring.



Brassica Sinapistrum. Boiss (Charlock.)

Origin.—This plant appears to be of European and Western Asiatic origin, but has become introduced to most temperate parts of the world.

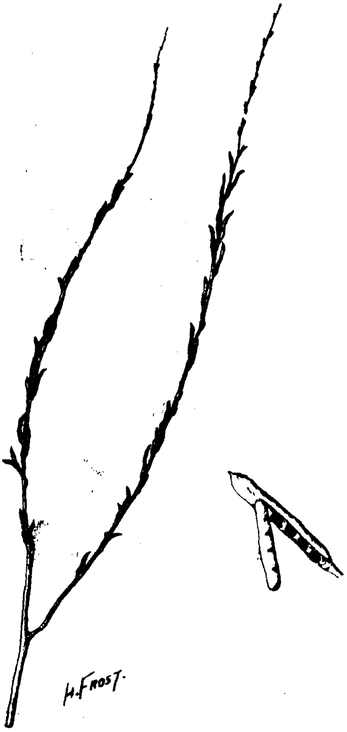
Localities where Found.—In our State it is found scattered here and there, wherever agriculture is carried on, but it is not very common. It has been taken at Riverton, Roseworthy, Wasleys, and Saddleworth by the writer.

Its Agricultural Importance.—This is a bad agricultural weed almost confined to cultivated crops in this and the Old World. Long[4] gives it as producing upwards to 4,000 seeds per plant, and points out that the seeds remain viable up to 40 years in the soil. In the face of such evidence it is most important to prevent this plant from seeding.

Under our conditions the plant is by no means as prevalent as one would assume from conversation with farmers. They frequently use the name "Charlock" in mistake for Wild Mustard.

Where it does occur its robust habit of growth causes serious competition with sown crops. Its hard fibrous stems cause infinite trouble to the knives of machines in hay crops, as well as lowering the value of the product. In grain crops the hard branches cause great loss of time and grain through frequently causing chokes in the combs of the machines. In an attempt to overcome this disadvantage the combs are often opened to such an extent that clean harvesting is impossible, thus losing much grain.

In crops badly infested with this weed it is often necessary to have it pulled by hand; this, of course, is an economic waste in labor and crop.



Brassica adpressa. Boiss (Buchan Weed.)

In pasture the weed is of no significance, as it rarely germinates under such conditions, besides which animals will freely graze it and keep it under control.

Control.—Under conditions of more intensive culture than practised here, this weed is frequently destroyed by spraying it with a 4 per cent. solution of bluestone and water or a 15 per cent. solution of iron sulphate applied at the rate of 40galls. per acre, the operation of spraying being carried out in warm, calm, dry weather.

Under our conditions the careful preparation of the seedbed, with special care to the autumn pre-seeding cultivations is absolutely essential if the weed is to be kept under control. The use of fast growing varieties will also help in keeping it in check. In conditions where the plant gains supremacy it is often necessary to resort to hand pulling.

In pasture the weed is of no consequence, being controlled by sheep.

Soils Favored.—The plant shows little preference for soil types, being found on almost all classes in most rainfall conditions. Naturally the plant makes most luxuriant growth on the richer types of soil. In fact almost any arable land will grow this weed freely.

Brassica adpressa. *Buchan Weed.*

Description.—A plant very similar to Charlock in most of its features, but differs greatly in the shape and size of the seed pod, and whereas in the former species the pods diverge from the flowering stem, in this species they lie closely pressed to it. The pods are about half the length of those of Charlock, and are terminated by a swollen beak occupying about half the length of the pods. The seeds are fewer and smaller, borne on each side of the central partition. It flowers freely in the early spring.

Origin.—A Mediterranean plant which has established itself in many parts of the world.

Localities where Found.—This weed is much more common than the preceding species, and can be found almost throughout the State. It has been noted at Auburn, Clare, Riverton, Saddleworth, Farrell's Flat, Hoyleton by the writer, and is recorded in the South-East by Black.[1]

Its Agricultural Importance.—This weed differs from the preceding species in that it grows freely in both cultivated and uncultivated land; often growing almost up to the metal of many roads. In crops it is subjected to the same difficulties as Charlock, but is not quite so robust a grower, and therefore the crop often competes with it, to its extinction, but under conditions in which the crop receives a check this plant very quickly gains the upper hand, when infinite trouble and loss occur. Under pasture conditions the plant is not serious if stock have access to it while it is still young, when they eat it freely. When more mature, however, animals will not touch it. Fields have been noted where this weed was almost the only plant growing.

Taken in excess by sheep or cattle it is apt to taint their edible products and bring about a lowering of prices received for them.

The outstanding point of difference between these two ***Brassicae*** is that Charlock is essentially a weed for cultivated land whereas Buchan Weed will grow on either cultivated or uncultivated land, but appears to do better on the latter.

Control.—Under cropping conditions this weed does not offer a great deal of difficulty to control where ordinary thoroughness of fallowing, seeding, &c., is applied. Under conditions where the weed has been thick previously the later sowing with an early variety of wheat, so as to allow more time in which to cultivate, may be advantageous.

In ley land it can be controlled by animals, preferably sheep, but it is essential to allow them access before the plant begins to produce flower stalks.

In a crop it is seldom necessary to hand pull this weed, as when not in profusion it can be handled satisfactorily by the average machines.

Soils Favored.—There seems to be a preference shown for a richer type of soil typified by the red-brown earths of the Lower North and South-East. It is also found growing freely on the limestone outcrops occurring within such areas, but it does not appear to have established itself on the more calcareous soils of the Adelaide Plains.

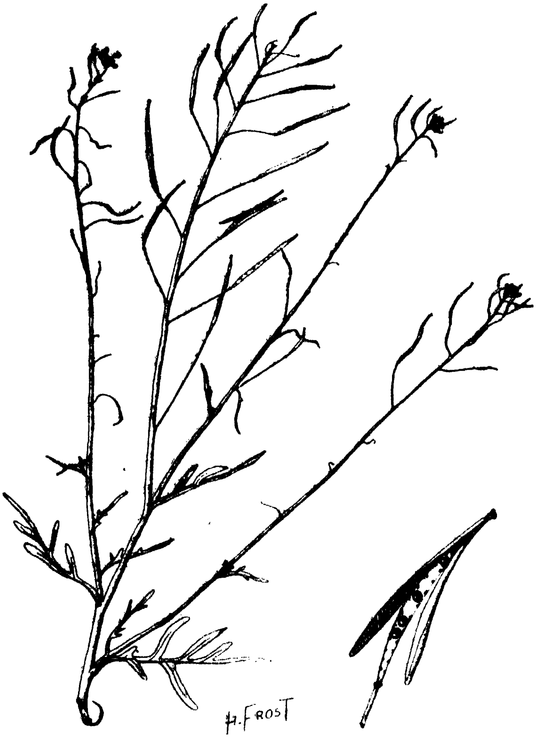
Diplotaxis tenuifolia. *Lincoln Weed.*

(Also known as Chilpanunda Weed on Eyre's Peninsula.)

Description.—A hairless perrenial with erect stems; leaves much divided or toothed, particularly so in the lower ones; those higher on the stems narrower and less toothed; flowers yellow in color carried on rather short stems which when the pod forms spread away from the flowering branch; pods are from 1¼-1¾in. long and about 3/16in. in diameter; it opens by two valves leaving the small yellowish-brown seeds attached to the central partition; they soon fall, thus leaving the paper-like partition intact. The plant is further characterised by its distinctive objectionable odor, to be found only in this family. Flowering occurs at almost any time of year.

Origin.—It is apparently of European origin, extending into Western Asia, but has become established in many parts of the world.

Localities where Found.—It is found chiefly on Eyre's Peninsula from Port Lincoln almost to Streaky Bay. Its frequency at Port Lincoln has led to the vernacular name suggested. It does not appear to have extended greatly on the Eastern coast of the Peninsula and is not very frequently met with in other parts of South Australia.



Diplotaxis tenuifolia. (L.) D.C. (Lincoln Weed.)

Its Agricultural Importance.—Other than certain districts offering especially suitable conditions this plant does not present any features of agricultural importance; but in such areas that are suitable the plant causes a reduction of cereal returns by its ability to rob the crops of plant foods, &c. It thrives equally on cultivated and uncultivated land. On fallows the plant is a considerable nuisance, necessitating frequently repeated workings if it is to be held in check. It causes greatest inconvenience in crops used for hay, as it renders the cutting very difficult. In grain crops, if thick, it smothers out the crop besides always robbing the soil of plant foods which should go to the production of marketable grain.

In pastures it excludes the more useful plants, so reducing the carrying capacity of the land. It is reported, by some, that sheep, when used to it, feed it freely, and it is argued that it increases considerably the carrying capacity of pasture lands. The point is doubtful, although it is known that sheep will graze the plant only when no other greenfeed is available. Further, if ingested freely it taints animal products, thus reducing their market value.

It is possible that the plant serves some useful purpose in sandy districts near the coast, in so far as it gives some cover during the summer and affords something green for animals to pick at. It may also act on such soils as a preventive of drift, although in this connection it cannot be regarded very seriously.

Control.—Being a deep-rooted plant, early and thorough cultivation is necessary to keep it in check. Care must be exercised not to work the land while very wet, as sections thus cut off and shifted will root and tend to thicken up the stand.

When well established it is difficult to control as it grows freely from those sections below the ordinary level of cultivation, thus necessitating more frequent workings.

There is little danger of the seed being carried to clean land if the seed of the crop sown is first subjected to the process of grading.

Soils Favored.—The extent of the plant's presence in this State appears to be limited to those calcareous sandy soils within a few miles of the sea. It is rarely found on heavier types of soil inland on Eyre's Peninsula, nor does it occur on those types of soil on the eastern shores of the gulf. It is significant therefore that this plant requires the influence of the sea and light soils upon which to thrive, and so far its suitable habitat is limited to Eyre's Peninsula along the western coast.

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1. J. M. Black, Flora of South Australia.
2. L. H. Pammel: Manual of Poisonous Plants.
3. H. C. Long: Plants Poisonous to Livestock.
4. H. C. Long: Common Weeds of the Farm and Garden.

[*To be continued.*]

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MEADOW HAY COMPETITION.

In a report on the Meadow Hay Competition conducted by the South Australian Advisory Dairy Council, the Judge, Mr. R. Hill (Agricultural Instructor), stated that it was the second competition of its kind he had judged, and it was pleasing to have had an increased number of entries. There was a marked improvement in the quality of meadow hay made this season, and there seemed no reason why further improvement could not be expected through the medium of such competitions.

That the carrying capacity of the better rainfall country, especially, could be increased and the general health of livestock improved was certain, but the conserving of well-cured meadow hay was an important factor in doing so. Enormous quantities of valuable clovers and grasses were more or less wasted each year when left in the fields as dry feed with a loss of feeding value, to say nothing of the danger they present as ready fodder for destructive fires.

Suitability of Plants.

Practically all the meadow hay made in the better rainfall districts contained a high percentage of subterranean clover, and quite a quantity of it was pure clover hay. As a feed in itself it had rather a narrow nutritive ratio of 1 to 4, and other material with a higher carbohydrate content could be fed with it to advantage with the idea of making full use of the total digestible protein in the clover hay. Where the usual roughage for grazing was available, this wastefulness would be overcome, but it was where pure clover hay was used as a sole ration during lean periods that so much waste was evident.

With the usual annual grasses such as soft brome grass, sterile brome grass, and others that generally made their appearance in pastures in conjunction with subterranean clover, the nutritive ratio was more balanced. Of the grasses, perennial rye grass was the most valuable in the meadow hay, but unfortunately a reasonable percentage was found only on rare occasions. Clustered clover, which was the most valuable of our naturalised clovers if present in any quantity in a mixture with subterranean clover, was also helping to balance the nutritive value.

Where perennial grasses could not be grown to advantage Wimmera rye grass would make an excellent hay in conjunction with subterranean clover.

It was very evident that for some time to come the majority of the meadow hay would be subterranean clover mixed with a comparatively small quantity of annual grasses.

The Stage of Cutting.

The stage of cutting was extremely important in hay making, and this operation decided whether there was a reasonably good opportunity of making high quality hay. Although considerable improvement was noticeable this season there had been a general tendency to allow plants (particularly grasses) to become too mature before cutting, and consequently, by the time this operation was completed the fault became increased. Quite a common statement by farmers was that they commenced cutting too late, but Mr. Hill stated that he had never yet heard it said that they had cut too soon.

It was established knowledge that leaf was more nutritious than stem, and as grass and clover plants approached botanical ripeness the digestibility and productive value of the dry matter diminished. Any weight gained by allowing grasses to seed was counterbalanced by the loss of digestibility and feeding value, and investigations showed that generally there was no increase in the total weight of a hay crop after a week before the bulk of the grasses flowered.

Hay cut early, when the earliest maturing plants in the mixture were at the flowering stage, was distinguished by its high percentage of flesh and milk forming material and by its relatively low content of indigestible fibre.

Where perennial plants were concerned, late cutting had a hindering effect on the early growth following. Palatability was another important factor with any feed, and the earlier cut hay was certainly relished more by livestock.

CURING.

The next operation after cutting was curing, which was very often hindered in the wetter districts by unsuitable weather conditions. A reliable guide as to when the material was ready to cart from the field was to take a handful of stems and twist them into a rope, and if no moisture could be squeezed out the material was ready to cart. This was, of course, no guide in the case of over-dried hay, but it should be remembered that hay should be carted out of the field as soon as it was safe to stack, so preventing as much as possible over-exposure and ultimate waste in feeding value.

Clover hay needed more time to cure than a mixture of clover and grasses, but the one factor in common was to cure quickly and lose as little leaf as possible.

Material ready for cutting contained about 75 per cent. of moisture, and hay 12-15 per cent. of moisture. If the moisture exceeded about 20 per cent. when stacked rapid fermentation might take place, particularly in large stacks, causing considerable loss of digestible matter, if not actual ignition. Such fermentation could be minimised by the liberal use of salt, and as high as 40lbs. to the ton of hay had been used, but the general quantity was 10lbs. per ton.

After cutting, the hay was generally raked into windrows to allow it to dry, and then very often carted straight to the stack within a few days, according to the weather conditions. Should wet weather threaten it should be placed into cocks in order to reduce the surface and minimise the amount of rain which tended to discolor the hay and wash out valuable nutrients. An inch of rain meant 100 tons of water per acre, and if, by cocking, the surface area of hay could be reduced by even one-tenth it considerably reduced loss.

With favorable weather conditions competitors stacked the hay from three to five days after cutting, and successfully made really good hay. However, there were so many factors to consider that no definite time could be set down for curing. One thing certain was that some of the methods adopted in this State would have been condemned by farmers 100 years ago, and it was surprising that some farmers did not realise that their losses were due to inefficient practices.

BROWN HAY.

Two stacks of what was commonly known in England as "brown hay" were inspected this season and one was that of Mr. R. C. West, and included in this competition. Where weather conditions were wet and generally poor for hay-making, some of the English farmers resorted to making this type of hay, and made small stacks containing a few loads of comparatively green material in the fields. These stacks obtained very high temperatures, which caused the material to become brown, and the higher the temperature the browner the hay and less digestible the proteins. The idea was to obtain better hay than would be the case if the material were left out exposed to the weather until it was safe to place into large stacks, and with these small stacks in the field the heat was better able to get free. The small stacks were later carted and made into large stacks. The stack inspected in this competition had not been made in this manner, but had been carted directly to the main stack, and no doubt the heavy application of 40lbs. of salt to the ton of material prevented much of the fermentation. However, livestock relish it and take it in preference to ordinary meadow hay, and

Mr. West assured Mr. Hill that the cows were milking better on it. Weather conditions were not generally bad for hay making in this State, hence we are not compelled to resort to this method. It does not seem advisable, therefore, to attempt it unless in an experimental way, until we are satisfied that it has any definite advantages for our conditions. It does seem necessary, though, that to obtain the best results from meadow hay the material should be stacked sooner after cutting than is the general practice at present.

STORING.

Meadow hay could be stacked in the open sooner than in enclosed sheds, and also sooner in long, narrow stacks than in large, square stacks on account of the better opportunity for the release of any heat generated. Salt could be used to advantage, both as a means of minimising fermentation and also as a means of improving the palatability of the hay.

Common and Botanical Names of Plants included in the Entries.

Subterranean clover	*Trifolium subterraneum.*
Hop clover	*Trifolium procumbens.*
Clustered clover	*Trifolium glomeratum.*
Narrow leafed clover	*Trifolium angustifolium.*
Knotted clover	*Trifolium striatum.*
Perennial rye grass	*Lolium perenne.*
Soft brome grass	*Bromus hordeaceus.*
Sterile brome grass	*Bromus villosus.*
Silver grass	*Festuca myuros.*
Barley grass	*Hordeum murinum.*
Yorkshire fog grass	*Holcus lanatus.*
Sorrel	*Rumex acetosella.*
Cape weed	*Cryptostemma calendulaceum.*

Details of Entries.

Competitor.	Address.	Position.	Suitability of Plants. 25	Curing. 25	Stage of Cutting. 15	Apparent Nutritive Value. 25	Storing. 10	Total. 100
F. Walkley	Myponga.	1	22	24	14	23	10	93
Illowra Estate Ltd.	Inman Valley. . .	2	23	23	14	22	10	92
F. C. Keen	Victor Harbor . .	3	22	23	14	11	8	89
H. A. Woolley (2) .	Mt. Barker Junc.	4	22	22	13	22	9	88
P. J. James	Inman Valley. . .	4	22	21	14	21	10	88
R. Peters	Mt. Compass . . .	6	21	22	13	21	10	87
A. M. Fuller	Inman Valley. . .	7	21	22	14	20	9	86
H. J. Jagger	Inman Valley. . .	8	21	22	14	20	8	85
H. A. Woolley (1) .	Mt. Barker Junc.	9	22	21	12	21	8	84
C. E. Verco.	Mt. Compass . . .	9	20	21	13	20	10	84
W. F. Roads	Inman Valley. . .	9	21	21	12	20	10	84
D. F. Sheppard . . .	Prospect Hill . .	12	21	19	12	21	10	83
R. Ennis	Echunga	13	20	20	12	20	10	82
Mrs. A. D. Liebelt.	Littlehampton .	14	21	18	13	20	9	81
R. C. West	Myponga.	15	21	18	12	19	6	76
H. B. Peters	Mt. Compass . . .	16	23	17	10	15	9	74
F. Keen.	Meadows	16	19	17	10	19	9	74

COMMENTS BY THE JUDGE ON THE STACKS ENTERED BY THE UNDERMENTIONED COMPETITORS.

1. *F. Walkley.*—An exceptionally well-built stack, neatly thatched to a gable with thatch grass such as one seldom sees in this country. The sides were well trimmed and the hay particularly well preserved. A mixture of subterranean clover, soft brome grass, sterile brome grass and silver grass really well cured and salted at the rate of 10lbs. of salt per ton of material. Some of the grasses were a shade on the matured side, but generally it was excellent hay readily eaten by livestock without any waste. It was estimated that this hay yielded five tons to the acre.

2. *Illowra Estate Ltd.*—Another entry of really well-cured hay, well housed in a hay shed. The material had been cut at the correct time, making full use of the grasses and providing a well balanced, well-cured, palatable fodder. Raked into windrows where possible the same day as cutting, and carting was commenced two days after cutting was completed. A mixture of subterranean clover, perennial rye grass (a fair amount), soft brome grass, sterile brome grass, silver grass, and barley grass. Salted at the rate of 10lbs. per ton of hay, and a good color had been retained. A splendid sample of hay.

3. *F. C. Keen.*—A tall stack in the open, 18ft. by 12ft., with a very high gable. A good mixture of subterranean clover, hop clover, clustered clover and a good percentage of grasses which were well-cured and consisting of perennial rye grass, soft brome grass, sterile brome grass, and barley grass. A well balanced mixture, although some of the grasses were of inferior type, but being cut at the correct time and well cured made a very palatable and nutritious hay. Cocked three days after cutting and carted a fortnight after cutting.

4. *H. A. Woolley* (2).—A stack 45ft. by 12ft., well thatched with cereal straw. A mixture of clustered clover, subterranean clover, perennial rye grass, soft brome grass, sterile brome grass, and silver grass. Cut at the correct time and well cured. A good mixture of grasses and clovers, balancing well as a nutritious and palatable hay.

4. *P. J. James.*—Stacked in a shed without sides, 50ft. by 15ft. Practically pure clover with only a trace of silver grass, soft brome grass, and sterile brome grass. Cut at the correct time; good hay, although it would have been better had it contained more of the grasses. Although some was slightly brown in color the majority retained its color well. Cocked after cutting and left in the field on an average of about a fortnight before carted. Mr. James had fed this hay without concentrates to his cows for two months and they had not shown any decrease in their milk yield.

6. *R. Peters.*—Really good hay well housed in an enclosed hay shed and consisting of a mixture of subterranean clover, perennial rye grass, soft brome grass, sterile brome grass, and a fair amount of shivery grass which was, of course, inferior. The stage of cutting could have been improved if the grasses were just a little earlier, but all materials were well cured. The majority of it was raked into windrows and carted from the rows three days after cutting, and the remainder cocked the day after cutting, which presumably was the last carted. Very good hay, having been cured quickly.

7. *A. M. Fuller.*—A stack of about 30 tons, part of which had been covered with galvanised iron. Contained a large percentage of subterranean clover, the majority of which had been cured well. Rather too much of the grasses was made up of inferior types such as barley grass and silver grass, although they were well cured. Palatable to livestock, and good hay cut at the correct time, except some of the barley grass, but it is difficult to avoid this grass from being matured when other grasses are at the correct stage for cutting. Cocked a day after cutting when possible, and from five to six days between cutting and carting. Cutting, carting, and stacking were all completed in 10 days.

8. *H. J. Jagger.*—Stacked partly in a hay shed and the remainder outside which was thatched with thatch grass. Consisted of hop clover, clustered clover, narrow-leafed clover, subterranean clover, knotted clover, silver grass, perennial rye grass, and some cape weed. The time of cutting was correct, and color had been well retained. Cocked three days after cutting and carted a fortnight after cutting. Quite good hay and palatable.

9. *H. A. Woolley* (1).—A stack 40ft. by 12ft. and covered with a sheeting of bags. Cut at the correct stage and had good color, with only the barley grass a little mature. A good mixture of grasses and clover consisting of subterranean

clover, clustered clover, hop clover, sterile brome grass, soft brome grass, barley grass, perennial rye grass, and silver grass. Palatable and fairly nutritious hay, well stacked, with the possibility of very little waste in feeding.

9. *C. E. Verco.*—Hay well housed in an enclosed shed. Principally subterranean clover mixed with soft brome grass, sterile brome grass, perennial rye grass and silver grass. Some sorrel throughout and the silver grass rather mature, but having been cured on rather damp soils it would be unwise to cut early enough to avoid this advanced stage of an early maturing grass such as this. The majority was raked into windrows two days after cutting, but some were carted without raking together and were rolled as left from the cutter. Carting was done three to five days after cutting. Really good hay.

9. *W. F. Roads.*—A stack 30ft. by 15ft. in roofed hay shed and consisted of subterranean clover, perennial rye grass, canary grass, soft brome grass, sterile brome grass, and silver grass. Grasses a little too mature, and although dry to the feel both clover and grasses had a good color. A fair percentage of grasses and palatable hay, but it could have been improved by less exposure to the weather after cutting.

12. *D. F. Sheppard.*—A mixture of subterranean clover, perennial rye grass, sterile brome grass, soft brome grass, and silver grass, but with the clover predominating. Curing was quite good where there were patches of pure clover, but some of the grasses were rather mature. Colour varied, due to some of the material having been left out rather long between cutting and carting. However, it was good hay although probably livestock would not relish some of the inferior grasses, which were rather fibrous. Well housed in an enclosed shed.

13. *R. Ennis.*—Almost pure subterranean clover with a trace of perennial rye grass, silver grass, sterile brome grass, and soft brome grass. All material would have been better had it been cut slightly earlier, preventing the grasses and some of the clover, too, from becoming quite so fibrous. However, it was good hay, palatable and nutritious. Well housed in an enclosed shed.

14. *Mrs. A. D. Liebelt.*—A good mixture of grasses and clover consisting of subterranean clover, perennial rye grass, sterile brome grass, soft brome grass, and silver grass. Cut at the correct time, but had been exposed to the weather too long after cutting, which had caused discoloring, and the material was brittle to the touch. Being exposed rather long before carting had reduced its nutritive value a little. A stack 40ft. by 15ft., well thatched with cereal straw.

15. *R. C. West.*—Principally subterranean clover with some sterile brome grass, soft brome grass, silver grass, and a little clustered clover. A stack 40ft. by 15ft. and partly covered with a tarpaulin, but not well stacked. The majority of the material had been cut at the correct time, but some of the grasses were a little too mature. After cutting it was put into windrows, and carting commenced on the second day after cutting and had salt added at the rate of about 40lbs. to each ton of hay. This method was adopted for the first 6ft. of the stack, and the remainder was carted about 10 days after cutting and had 10lbs. of salt to the ton of hay. It made a brown hay. Mould developed in parts, but generally it seemed very palatable, particularly the bottom layers, which were carted two days after cutting and were heavily salted.

16. *H. B. Peters.*—Stacked in a shed with an iron roof; a mixture of subterranean clover, Yorkshire fog grass, paspalum, and perennial rye grass in part of the stack and the remainder was pure subterranean clover. This hay was very musty, due, no doubt, to its growth on swampy land and probably cut a bit on the green side. It seems that under such conditions hay will have to be left in windrows for a longer time and probably turned to allow better drying of succulent material under damp conditions. Raked into windrows the day after cutting, then cocked the following day in fine weather, then carted between a week and a fortnight after cutting. It was unfortunate for Mr. Peters, who was

attempting to get best value from his hay, that it should have developed the musty condition, but it was one of those instances which taught something in the handling of hay under unfamiliar conditions.

16. *F. Keen.*—Principally subterranean clover, and other fodder consisted of clustered clover, hop clover, perennial rye grass, phalaris, soft brome grass, sterile brome grass, silver grass, Yorkshire fog, and a fair amount of that useless weed commonly known as "red devil" or bartsia. All plants were too mature, and the subterranean clover contained seed which was almost suitable for sowing. Rather discolored, and the nutritive value had been reduced by the fibrous nature of the plants and too much exposure to the weather after cutting. Well stored in a shed with open ends.

PARAFIELD POULTRY STATION.

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DAY OLD CHICKENS.—15s. per dozen; £4 per 100.

BLACK MINORCAS.

EGGS.—7s. 6d. per Setting of 15 Eggs. Incubator Lots, £2 per 100.
DAY OLD CHICKENS.—15s. per dozen; £4 per 100.

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C. F. ANDERSON, Poultry Expert.

PARAFIELD EGG LAYING COMPETITION, 1932-33.

A GENERAL REVIEW OF THE COMPETITION.

[By C. F. Anderson, Government Poultry Expert.]

The Egg Laying Competitions conducted at Parafield are all Single Test Competitions and extend over a period of 12 months.

The test under review commenced on April 1st, 1932, and terminated on March 31st, 1933.

There were 243 birds competing and each bird was housed in a separate pen, the dimensions of which are: Length 5ft. 5in., width 1ft. 11½in., 5ft. 6in. high in front and 4ft. 6in. high at back. The front of the pen is 1ft. of iron from the ground upwards. A door 3ft. 6in. high, then a space of 3in. for ventilation. The remainder of the height is taken up by the top and bottom rails on which the door closes, and to which the bottom iron is nailed. The back of the pen is a 4ft. sheet of iron, and a ventilation of 3in. running along the back is allowed, which is closed in winter.

The drinking water is supplied along the back of the pen, 4in. D guttering being used, over which a piece of 6in. x ⅞in. flooring board is hinged. This assists in keeping the water cool and clean, and protects the birds from draughts. A small hole 3in. square is cut in the iron at the back so that the bird can put her head through and drink.

The perch is 1ft. 3in. high from the floor level and 1ft. away from the back of the house.

The division between each pen is a 6ft. x ⅞in. board on the floor and the remainder 1½in. wire netting.

The nest is in the front of the pen. The feed and shell grit receptacles can be fixed to the piece of 3in. x 1in. oregon to which the iron is nailed.

A 7ft. sheet of iron is used for the roof, which overhangs 15in. in front.

The entries were as follows:—

	Birds.
White Leghorns	180
Black Minorcas	3
Anconas	3
Black Orpingtons	48
Rhode Island Reds	9
	243

Weighing of Eggs.—The rule with regard to the weight of eggs was:—Every egg laid by each bird from July 1st to July 31st, 1932, will be weighed the day after it is laid. Qualification for the purpose of this test shall be that 60 per cent. of the eggs laid during July, 1932, must be 2oz. in weight or over.

The following birds failed to qualify under this rule:—

16 Black Orpingtons
42 White Leghorns
1 Ancona

59 birds

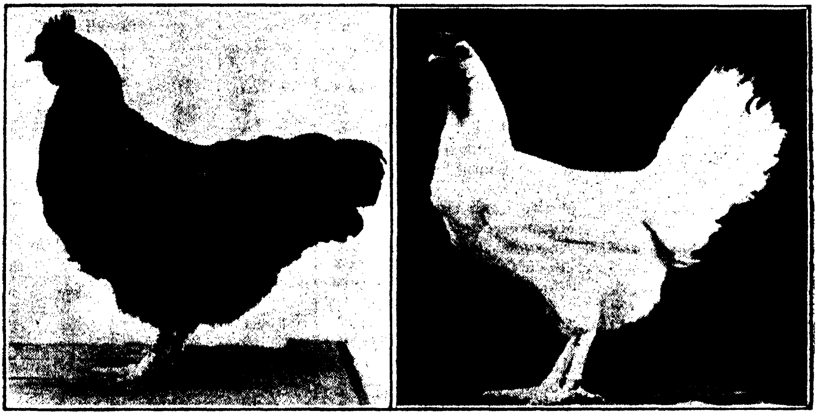
which is equivalent to 24 per cent. of the competing birds. This indicates very definitely the necessity for increased attention being given to the size of the egg. The importance of this aspect of poultry breeding has been stressed by the Department of Agriculture for many years, and there is ample evidence that the size of the egg generally is not up to standard. Now that the poultry industry is dependent on the export outlet for the surplus egg production, breeders will find that unless every effort is made to improve the size of the egg it is doubtful whether payable prices will be realised for overseas exports.

The scores of the birds which failed to qualify under this egg-weighing clause were not recorded after the end of July.

The leading scores for the Winter test from April 1st to July 31st, 1932, a period of 122 days, were as follows:—

WHITE LEGHORNS.

	Scores.	Bird Nos.
Singles—		
A. G. Dawes	85	53
R. C. Crittenden	79	35
A. G. Gore	79	79
C. F. Lindquist	79	102
B. Cooke	79	27
Trios—		
R. C. Crittenden	201	34–36
A. G. Dawes	179	37–39
W. C. Slape	177	136–138
Teams—		
A. G. Dawes	326	52–57
Thomas & Elston	301	139–144
A. G. Dawes	293	46–51



The Black Orpington entered by Mr. H. J. Mills laid the highest score (283 eggs) in the Competition. The White Leghorn was entered by Mr. A. G. Dawes and secured top place in the White Leghorn section with 260 eggs. This bird is of Parafield strain.

ANY OTHER LIGHT BREEDS.

Black Minorcas.

Singles—		
V. F. Gameau	39	179
Anconas.		
W. R. Williams	16	182

BLACK ORPINGTONS.

Singles—		
W. R. Williams	**90**	**226**
N. F. Richardson	**86**	**186**
H. J. Mills	**85**	**212**
Trios—		
N. F. Richardson	**229**	**184–186**
H. L. Twartz	**176**	**223–225**
Teams—		
H. J. Mills	**300**	**208–213** **(5 birds competing)**

ANY OTHER HEAVY BREED.

Rhode Island Reds.

Singles—		
V. F. Gameau	76	238
W. R. Williams	64	241
W. R. Williams	49	243
Trios—		
W. R. Williams	147	241-243

Deaths.—Twelve birds died during the currency of the Competition, which is equivalent to 4.9 per cent. The following table shows the average number of eggs laid each month by the various breeds. The varying numbers of birds shown each month is accounted for by birds being disqualified through not passing the required weight of eggs, and also by birds dying during the period of testing.

Table I. showing the average number of eggs laid by the various breeds:—

Date.	Breed.	No. Birds.	No. Eggs Laid.	Average No. Eggs Laid.	Average No. Eggs Laid by all Birds.
1932.					
April	White Leghorns	180	1,976	10·97	10·42
"	Minorcas	3	9	3	
"	Anconas	3	15	5	
"	Black Orpingtons	48	446	9·29	
"	Rhode Island Reds	9	88	9·77	
May	White Leghorns	180	2,158	11·98	12·06
"	Minorcas	3	21	7	
"	Anconas	3	3	1	
"	Black Orpingtons	48	671	13·97	
"	Rhode Island Reds	9	79	8·77	
June	White Leghorns	177	1,884	10·64	11·30
"	Minorcas	3	19	6·33	
"	Anconas	3	—	—	
"	Black Orpingtons	48	713	14·85	
"	Rhode Island Reds	9	98	10·88	
July	White Leghorns	134	1,950	14·55	14·85
"	Minorcas	3	35	11·66	
"	Anconas	2	21	10·50	
"	Black Orpingtons	32	538	16·81	
"	Rhode Island Reds	8	115	14·37	
August	White Leghorns	134	2,514	18·76	18·59
"	Minorcas	3	40	13·33	
"	Anconas	2	38	19	
"	Black Orpingtons	32	589	18·40	
"	Rhode Island Reds	8	147	18·37	
September	White Leghorns	134	2,587	19·30	19·86
"	Minorcas	3	57	19	
"	Anconas	2	36	18	
"	Black Orpingtons	32	712	22·25	
"	Rhode Island Reds	8	164	20·50	
October	White Leghorns	134	2,673	19·94	19·93
"	Minorcas	3	57	19	
"	Anconas	2	42	21	
"	Black Orpingtons	32	630	19·68	
"	Rhode Island Reds	8	166	20·75	

TABLE I.—*Continued.*

Date.	Breed.	No. Birds.	No. Eggs Laid.	Average No. Eggs Laid.	Average No. Eggs Laid by all Birds.
1932.					
November	White Leghorns	133	2,439	18·33	18·42
"	Minorcas	3	53	17·66	
"	Anconas	2	37	18·50	
"	Black Orpingtons	32	627	19·59	
"	Rhode Island Reds	8	123	15·37	
December	White Leghorns	133	2,474	18·60	18·09
"	Minorcas	3	53	17·66	
"	Anconas	2	37	18·50	
"	Black Orpingtons	32	534	16·68	
"	Rhode Island Reds	8	123	15·37	
1933.					
January	White Leghorns	131	2,054	15·67	15·63
"	Minorcas	3	32	10·66	
"	Anconas	2	38	19	
"	Black Orpingtons	32	508	15·87	
"	Rhode Island Reds	8	119	14·87	
February	White Leghorns	131	1,678	12·80	12·64
"	Minorcas	3	32	10·66	
"	Anconas	2	25	12·50	
"	Black Orpingtons	31	393	12·67	
"	Rhode Island Reds	7	73	10·42	
March	White Leghorns	131	1,456	11·11	11·31
"	Minorcas	3	28	9·33	
"	Anconas	2	24	12	
"	Black Orpingtons	31	392	12·64	
"	Rhode Island Reds	7	69	9·85	

From the preceding table it will be seen that the heaviest months of production were August, September, October, November, and December, with the month of October as the peak period of laying and March the lowest production.

The record period for any one breed for laying was recorded by the 32 Black Orpingtons competing during the month of September with the fine score of 22.25 eggs per bird for the 30 days. It should be remembered, however, that there were only 32 Black Orpingtons competing during that month, as compared with 134 White Leghorns.

The highest monthly average for the White Leghorns was recorded during the month of October, when the 134 Leghorns competed averaged 19.94 eggs per bird for the 31 days.

Average number of eggs laid for the 12 months by all competing birds:—

Period.	Breed.	No. Birds Competing.	No. Eggs Laid.	Average No. Eggs Laid per Bird.
April 1st, 1932,	White Leghorn	131	23,706	180·96
	Minorca	3	436	145·33
to	Ancona	2	303	151·50
	Black Orpington	31	6,074	195·93
March 31st, 1933	Rhode Island Red	7	1,241	177·28

Average for all birds competing, 182.52 eggs per bird.

In the foregoing table the Black Orpingtons have the highest average, being nearly 15 eggs per year higher than the White Leghorn, the average of 195.93 eggs laid by the Black Orpingtons can be considered very satisfactory, the White Leghorn average of 180.96 eggs is disappointing, and the general average of 182.52 eggs for all competing birds is only fair.

FEEDING.

The method of feeding adopted was:—

Morning.—Wet mash composed of equal parts by weight of bran, pollard, and wholemeal, 1lb. meat meal for 100 birds, and chaffed green feed, 40 per cent. to 60 per cent., according to the period of the year.

Midday.—Wheat.

Night.—Wheat.

The quantities fed per day per bird were:—

Bran ½oz. Pollard ½oz.
Wholemeal ½oz. Wheat 2oz.

The following table shows the average monthly price of the various foodstuffs delivered at Parafield:—

Average cost of the various footstuffs fed to the competition birds at Parafield from April 1st, 1932, to March 31st, 1933:—

Month.	Wheat.	Bran.	Pollard.	Wholemeal.	Meat Meal.	Onions.
1932.	Per bush.	Per bush.	Per bush.	Per bush. of 20lbs.	Per cwt.	Pence per lb.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	
April	3 4	1 0	1 0	1 2	14 0	1·50
May	3 4	1 0	1 0	1 3	14 0	1·50
June	3 4	1 0	1 0	1 3	14 0	1·50
July	3 3	1 0	1 0	1 3	14 0	1·20
August	3 3½	1 0	1 0	1 3	14 0	1·20
September	3 2½	1 0	1 0	1 4	14 0	4·00
October	3 6	1 0	1 1	1 4	14 0	4·00
November	3 3	1 0	1 1	1 4	14 0	·78
December	2 11½	0 11	1 0	1 4	14 0	·56
1933.						
January	2 11	0 11	1 0	1 4	14 0	·37
February	2 10	0 11	1 0	1 4	14 0	·37
March	2 8	0 11¾	1 1¾	1 4	14 0	·37
	37 10½	11 8¾	12 3¾	15 6	168 0	17·35
	Average per bush. 37·87d.	Average per bush. 11.72d.	Average per bush. 12·31d.	Average per bush. 15·50d.	Average price per cwt. 14/-	Average price per lb. 1·44d.

	Total Cost.	Total Quantity Fed.
	£ s. d.	Bush.
Wheat	29 3 10	185
Bran	6 14 9	138
Pollard	7 1 7	138
Wholemeal	8 18 3	138
		Cwts.
Meat Meal	5 12 0	8
		Lbs.
Onions	4 19 10	832
	62 10 3	

The average cost of feeding per bird was 5s. 1.74d.

EGG PRICES.

The average monthly prices received for eggs were:—

1932.	First Grade, 1⅞ozs. in Weight or Over. Per Dozen. s.	d.	Second Grade, 1¾ozs. in Weight. Per Dozen. s.	d.
April	1	4	1	2
May	1	5	1	3·35
June	1	2	1	0·78
July	1	0½	0	11·93
August	0	11¾	0	10·86
September	0	11⅞	0	8·75
October	0	11	0	8·88
November	0	9	0	8·08
December	0	8½	0	7·10
1933.				
January	0	9¼	0	7·15
February	0	11	0	7·95
March	0	11½	0	8·75

The average price for the year of first grade eggs, that is, 1⅞oz. in weight or over, was 11.33d. per dozen.

PROFIT OVER COST OF FEEDING.

The profit over cost of feeding is principally governed by two factors, namely, the average number of eggs laid per bird and the cost of feeding.

The average number of eggs laid by all birds under test was 182.52 eggs, and allowing for 75 per cent. to be first grade, that is 1⅞oz. in weight and over and 25 per cent. 1¾oz. eggs the return per bird was 14s. 1d. and the cost of feeding 5s. 1.74d., leaving a profit over cost of feeding of 8s. 11.26d. per bird.

The cost of marketing the eggs: that is, freight, selling commission, &c., was almost 1d. per dozen, and taking the 182 eggs per bird, which is approximately 15 dozen, the cost is 1s. 3d. per bird for the year. This reduces the net profit over cost of feeding of eggs on the farm to 7s. 8.26d. per bird, which figure is low when it is remembered that it is based on a 15-dozen average. In an Egg-laying Competition the birds are all in their first laying season, which is the highest period of laying, therefore on a commercial egg farm where the birds are left for two laying seasons, and in some instances three, on the above figures it is doubtful whether the profit over cost of feeding would be more than 5s. per bird. The test also illustrates the necessity for more attention being paid to the improvement of the laying of the stock and the aim of a better general average production. It is very doubtful whether the cost of feeding can be reduced much more, while the returns for egg values are now governed by overseas prices, a factor over which we have very little control. It is therefore to the gradual improvement in the egg laying that we must look for better returns.

The following were the winning birds in each section:—

WHITE LEGHORNS.

	Score.	Bird No.
Singles—		
A. G. Dawes	260	53
R. C. Crittenden	252	36
R. C. Crittenden	238	35
A. G. Gore	238	79
Trios—		
R. C. Crittenden	680	34–36
Thomas & Elson	643	142–144
W. C. Slape	631	136–138
Teams (6 birds)—		
Thomas & Elson	1,168	139–144
A. G. Dawes	1,038	46–51
A. G. Dawes	1,026	52–57 (5 birds competing)

ANY OTHER LIGHT BREED.

Singles—

Black Minorcas.

V. F. Gameau	161	180

Anconas.

W. R. Williams	157	181

BLACK ORPINGTONS.

Singles—	Score.	Bird No.
H. J. Mills	283	212
H. J. Mills	264	210
W. Woodley	256	234
Trios—		
H. J. Mills	699	208-210
H. L. Twartz	623	223-225
G. Frisby Smith	582	220-222
Teams (6 birds)—		
H. J. Mills	1,126	208-213 (5 birds competing)

ANY OTHER HEAVY BREED.

Singles—

Rhode Island Reds.

V. F. Gameau	200	238
H. Fidge	190	236
W. R. Williams	177	243
Trios—		
H. Fidge	515	235-237
V. F. Gameau	374	238-240 (only 2 birds competing)
W. R. Williams	352	241-243 (only 2 birds competing)

It will be seen that two Black Orpingtons owned by Mr. H. J. Mills laid the highest scores in the Competition. The winning score of 283 was an exceptionally good one, when the general low averages are considered.

A GENERAL SUMMARY OF THE RESULTS.

Number of birds that completed test	174
Average number of eggs laid per bird	182.52

Average of various breeds competing:—

	Birds.	Eggs.
Black Orpingtons	31	195·93
White Leghorns	131	180·96
Rhode Island Reds	7	177·28
Anconas	2	151·50
Minorcas	3	145·33

Highest score of individual breeds:—

Black Orpington	283
White Leghorn	260
Rhode Island Reds	200
Minorca	161
Ancona	157

Average cost of food per hen, 5s. 1.74d.

Average return per hen, 14s. 1d.

Average gross return per hen over cost of feeding, 8s. 11.26d.

Average net return per hen over cost of feeding, freight, commission, &c., 7s. 8.26d.

ESTABLISHING PASTURES IN THE TATIARA DISTRICT.

[*Paper read by L. J. Cook (Manager Kybybolite Experimental Farm) at the Conference of South-Eastern Branches of the Agricultural Bureau, Bordertown, April 5th,* 1933.]

Grass, that is, the growths produced from that large order of plants known by the botanist as *Graminae,* will always constitute a large proportion of the diet for livestock. It should be present in from 50 to 70 per cent. in all good pastures. *Graminae* belong to the large section of monocotyledons, plants that start growth with a single shoot from the seed, and send out more or less adventitious shoots from this main one.

They readily provide leaf feed, the quantity of which varies largely in different species, but they more or less all have the quality of continuing growth from their apex, and, therefore, generally speaking, are able to withstand grazing well.

MANY SPECIES OF GRASSES.

There are many and varied species of grasses. Some are soft and succulent, others rough, hard, and tough; some have fine narrow leaves, others broad and robust; length of leaf also varies. There are those that thrive best in the colder months of the year, and those that only make growth during the warm times of the season.

There are numerous annual species, some that tend to run to stem quickly without much leaf growth, while others produce a lot of leaf, and are slow to produce stem and seed.

Biennial types have the ability to live through summer conditions in their early life, but are usually a robust type, that quickly exhaust this perennial ability.

Then there are perennial grasses, that live and persist over a number, or unlimited seasons. The degree of persistency varies considerably in species. These species vary also in mode of growth; some form individual clumps of varying size, from small bottom grasses, such as the Fescues, to broad sods like Paspalum. Then there are those that send out runners which root at their nodes, as well as those that extend by means of underground stems. Many and varied are the growth methods of grasses so that Nature has provided some species in this great order of plants to suit practically every condition of climate and soil where growth of plants is at all possible.

However, amongst all these kinds, there are comparatively few, particularly of the good, succulent sorts, that thrive well under local conditions. It must be conceded, however, that extended trials under improved conditions, of thorough preparation, selection and breeding of types, and fertilisation have not been made.

The poorer sorts of grasses, such as silver grass, readily establish themselves after crop cultivation. Also barley and brome grasses start naturally, but although these in their younger stages provide quite useful early feed, as they mature their feeding value deteriorates, and their obnoxious seed heads are troublesome to livestock.

POORER ANNUALS LACK FEEDING VALUE.

It is a known fact that stock grazing on these grasses thrive well on them while they are young and growing, but when forced to subsist on them in the autumn and dry periods the stock lose considerable weight. This is true of practically any annual grass, but more so with these poorer types with the bad seed heads and comparatively short growing period.

In this district, where crop production is the main work, it is not expected that perennial grasses would be greatly considered, but careful consideration can be given to the establishing of a better type of annual grass to occupy the land in the grazing years of rotations. However, soil conditions vary within the district, often even on individual farms, consequently a variation of process, specie, type, or strain is often advisable in close proximity.

TYPES OF SOIL.

So far as I am acquainted with the Tatiara district, there are four main types of soil:—

1. The heavy dark crab-hole soils, that carried bull oak naturally.
2. The heavy loams or red gum lands.
3. The lighter sandy loams or desert gum lands.
4. The sands or strinky bark lands.

The first of these is distinctly a rich type of soil, capable under good cultivation methods of producing very heavy yielding cereal crops, and not at present recommended for purely pasture fields. They are well supplied naturally with available nitrogen, and with the addition of phosphatic fertiliser can be classed as ideal for producing the annual winter growing species of gramineous plants.

The grass most suitable for these soils is the annual or Wimmera rye grass, and could readily be used on fields temporarily left out of cultivation. Sown at the rate of 8lbs. per acre on stubbles it should provide a lot of feed superior to that of barley grass. It is a good germinator, and makes quick initial growth. It is checked somewhat by cold, wet conditions in winter, more especially where the humus or nitrogen supply in the soil is short, but makes a good spring growth, which, if necessary, can be utilised for making a good class ensilage or hay. It starts growth as quickly as the naturalised grasses, and has a longer growing period, continuing later into the early summer than barley or brome grass.

Not much selection work has yet been done with this grass, but when available it would be advisable to secure seed from a good, leafy type in preference to the type that tends quickly to become stemmy with little leaf. In cases where it is desired to have pasture over a number of seasons in preference to cereal growing, legumes useful to grow with the grass are the melilots and medics. King Island meliot would thrive well, and possibly sweet clover, as well as lucerne and yellow trefoil.

The loam soils of the red gum lands are also good cereal producers, which need the humus or nitrogen content more carefully preserved, and possibly more attention given to the lime content. Consequently less cropping and more pasture and stock raising would be advantageous to the fertility of these lands. To maintain good grass on them careful attention to the supply of nitrogen must be observed. In many seasons when the rainfall is up to or above average, subterranean clovers should thrive well, as also would clustered clover, and these will maintain the organic needs of the soil and enable a good strain of annual or biennial rye grass to make a first-class pasture.

PERMANENT PASTURES.

For permanent pastures *Phalaris tuberosa* is the hardiest of perennial grasses, existing over longer dry summer spells than others, and although it is slower to respond to autumn rains, it is one of the best winter growers available, and appears to thrive under a shortage of nitrogen better than others. In establishing this grass, however, very careful preparation of the soil is needed, as it is a poor fighter against competition during its first season. It is best sown only with clover, but when sown in mixture with rye grass, there should not be more than 2lbs. rye grass seed per acre, and not less than 2lbs. *Phalaris tuberosa* seed.

It is possible that strains of perennial rye grass will persist for a number of seasons on these soils when in good fertility, but the work of testing these is not sufficiently advanced.

The native *danthonia*, or wallaby grass, is at home on these soils, but a type of this grass that can be readily and thickly established on cultivated land has not yet been fixed. Well fertilised it provides excellent sheep feed, and withstands sever dry conditions, but bringing it back on to the cultivated areas is greatly handicapped by its slow establishment.

SANDY LOAM SOILS.

Referring to the lighter sandy loams on the fringe of better lands in the district, this type of soil needs careful handling to avoid undue exhaustion, and the period of pasture should be greater than that of crop growing in the rotation system adopted. In other words, these soils do not readily lend themselves to continuous cultivation, and periods of pasture and stock grazing interspersed with an occasional cereal crop would lead to most remunerative results, combined with the building up of the fertility of the soil.

For these soils I must again refer to the importance of nitrogen to maintain grass, so that in establishing grasses due consideration must always be given to grow clover with them. Subterranean clover is the best species to aid in building these soils, and will thrive in most seasons. An early maturing sort would probably give best results initially. Together with Wimmera rye grass it should make good initial pastures, and when, after a decade of improvement by these plants and superphosphate, the soil becomes enriched, the possibilities of *Phalaris tuberosa* and special strains of perennial rye are feasible.

The naturalised clovers, such as cluster, hop, woolly, and drooping, will all help with the aid of superphosphate in the betterment of these soils, but I know of no annual grass superior to Wimmera rye to enhance the grass supply. During the early years of improving these soils it is doubtful whether even Wimmera rye will produce more feed than the naturalised annual grasses, such as barley and brome, but it is of better feeding quality.

Considering that the brome grasses (particularly sterile brome) do so well naturally in providing early feed, it is somewhat unfortunate that we have not a type of these without objectionable seeds to recommend. Prairie grass (a really good type of brome), however, has proved a failure under field conditions. Possibly if our naturalised bromes were put under exhaustive selection and breeding tests a useful type might be evolved.

With reference to the fourth main type of soil, namely, the deep sands, or stringybark lands, at this stage of development these are best left in their natural state, or possibly used for afforestation. It would scarcely be economical to attempt to establish grass upon them.

BEST GRASSES FOR DISTRICT.

Summarily, the following four are the principal grasses suitable to the district:—

Annual or Wimmera rye grass is undoubtedly the most valuable for the district. It could be grown for seed production on some of the good soils, and thereby save costly importations of seed. It will thrive for a number of years in pastures, but likes some cultivation, hence, if relying on it in a permanent pasture, give rigorous harrowing in the autumn to pastures.

Phalaris tuberosa is a particularly good winter grower; lasts late into the spring, but is somewhat slow to start in the autumn. Needs very careful treatment during its first season. Must be sown on a very clean and well prepared seed bed, and preferably without other grasses. Graze sparingly the first season.

Certain strains of perennial rye grass should persist on the richer soils of the district for a number of seasons. It is easily established when autumn sown on good seed bed, and makes comparatively rapid growth the first season. Usually withstands the first summer well, and responds quickly to autumn rains. It is quickly retarded by cold, wet conditions of severe winters, and in soils of poor fertility the loss of plants in winter months is greater than that during dry summers.

The native wallaby grasses provide first class sheep feed, are perennial, respond quickly to all summer and autumn rains, and when well fertilised maintain a good healthy appearance during winter months.

There are a number of other grasses which for special purposes might be of very good value, but, generally speaking, the above four must be looked upon as the most proven.

ORCHARD NOTES FOR SOUTHERN DISTRICTS, MAY, 1933.

[By CHAS. H. BEAUMONT, Horticultural Instructor.]

The month of May has been proved to be the best for planting out new trees except citrus. The young trees start making root whilst the soil is warm, and they get a hold before the dormant period of winter, and are ready to get right away when spring comes. Do not plant in very wet soil, which should be crumbly; tie at once to the stakes to prevent motion.

Pruning may be started, taking apricots and peaches first, or any trees or vines which have shed their foliage. It is good practice to have a good look at the trees before starting, and decide on any big limbs which must come out, and before making big cuts see that the saw is clean and sharp. Clean up the cuts at once and apply thick white lead paint; this is specially necessary when diseased limbs are removed. Pruning generally should be light and the fruiting habit of the tree noted. Beginners should consult the Instructor in their district.

Cover crops should be doing well and making an abundance of humus.

Plough as soon as possible, leaving the soil in the rough, but taking care that suitable outlets are available for storm waters; in any case fork around the trees. Spray all trees which have been affected by fungus diseases with Bordeaux mixture before the leaves fall, and use some of the spray on fallen leaves.

Brown rot is to be expected on oranges and lemons. The only way we have to control this trouble is to spray with Bordeaux and keep limbs from the ground. A mulch of straw or dry grass will help to prevent the splashing of heavy rain from the soil. The winter months may be used to check the many insect and fungus pests by keeping the orchard and sheds free from rubbish and decaying fruits, and by removing loose bark from the trees. Bandages on apple and pear trees may be removed later on and grubs destroyed.

Remove glass from tomato-houses and work the soil. Prepare seedbeds and get the seed in. Use only known clean seed.

Fruit in store needs watching; any damaged fruit must be removed.

METHODS SUGGESTED FOR IMPROVING THE PRODUCTION OF WHEAT IN THE TATIARA.

[By E. S. ALCOCK, R.D.A., Agricultural Instructor.]

The subject—Production of Wheat—has been dealt with from time to time for other wheat growing areas in South Australia, and it is intended in this article to deal with those methods which will apply to the Tatiara district. In this district two distinct types of soil are met with, viz., black or grey loams which are self mulching, and red clay loam, which runs together and sets readily. For the first type the results obtained at Longerenong College, Victoria, should be useful, and for the red soils Booborowie Experimental Farm results are quoted on account of similar soil types. The main factors over which we have control may be enumerated as follows:—1. Cultivation. 2. Manuring. 3. Varieties. 4. Rotation of crops.

It was pointed out by Mr. W. J. Spafford (Deputy Director of Agriculture) that the main factor responsible for increasing the wheat yield in South Australia was improved methods of cultivation. These had played a much more important part than was generally recognised. The use of superphosphate had played a very important part, but to the use of fertilisers must also be added the better methods of cultivation, for the application of fertilisers would not make up for lack of cultivation.

Depth of Ploughing—Results Roseworthy College, 1911-1928—16 *Years.*

2in.		4in.		6in.		8in.		10in.		12in.	
B.	L.	B.	L.	B.	L.	B.	L.	B.	L.	B.	L.
15	40	17	9	16	58	16	48	16	22	15	33

Booborowie Experimental Farm, 1916-1928—13 *Years.*

3in.		6in.		9in.		9in., then twice ploughed 3in.	
B.	L.	B.	L.	B.	L.	B.	L.
26	50	27	28	27	34	26	43

From these figures it will be seen that at Roseworthy the best yields were obtained from ploughing 4in. deep, whilst at Booborowie the deeper ploughings gave a slight increase, but it was not sufficient to justify the extra expense. Another interesting point is that the deep ploughing did not depress the yield where the cultivation had been carefully carried out. Neither have any ill effects been noticed from ploughing the land at the same depth over a seven year period, and the hard pan which is often mentioned was not noticeable. This was further proved by the plots which were ploughed 9in. deep every third year, as no advantage followed this practice. It is interesting, however, to note the effect of the variation in wet and dry seasons at Booborowie Farm:—

	3in.		6in.		9in.	
	B.	L.	B.	L.	B.	L.
Dry years— 1918, 1919, 1925, 1926, 1927, 1928 ..	24	13	24	4	24	34
Wet years— 1916, 1917, 1920, 1921, 1922, 1923, 1924	29	4	30	24	30	9

In wetter seasons there appears some advantage in favor of the deeper ploughing, but very little advantage in dry seasons.

FALLOWING.

At Roseworthy, Booborowie, in other Experimental Stations and in the other States as well, the practice of early fallowing is supported. At Roseworthy the figures show 1bush. more per acre for July ploughing, whilst at Booborowie a 2½bush. increase was obtained. At Booborowie for 13 years the figures were:—Early fallowing, 27bush. 32lbs.; late fallowing, 25bush. 11lbs.; and autumn ploughing, 19bush. 56lbs.

Some interesting results were secured from the cultivation tests at Booborowie which are worth recording here. The paddocks fallowed early and left rough during the winter gave better results by 26lbs. of grain per acre than those fields harrowed immediately after ploughing, and 49lbs. better than the field rolled immediately after ploughing. So, in this type of land no advantage is to be gained by harrowing immediately after ploughing, whilst rolling reduces the yield. The results of early fallowing in wet and dry years are rather striking, as will be seen by the following figures:—

Fallows.	Wet Years.		Dry Years.	
	B.	L.	B.	L.
Early Fallow	30	30	24	5
Late Fallow	27	41	22	26
Autumn Ploughing	21	22	18	23

These figures are again supported by the results obtained at Longerenong College.

	Bushels.
Ploughed in July, 3½in. scarified August, not cultivated until seeding, but merely "sheeped"	14
Ploughed in June, 3½in., not fallowed	8
Ploughed in March, 3½in., scarified end of July, 3½in., then cultivated when necessary	27.8
Spring-toothed in March, 2in., ploughed in July, 3½in., worked when necessary	29.1

These results are for a three year period, and the reports state that they are not conclusive regarding the advantage of summer over winter fallowing. Although the figures certainly show a big advantage, this is not always borne out so markedly as in these instances, for H. G. Stening, Chief Inspector of Agriculture, New South Wales, says regarding cultural operations in Crop Competitions in his State: "The advantages of early fallowing are clearly indicated in the result of this Competition for the Champion Crop, and the same remarks apply equally to the second prize crop, and their success largely lays in giving attention to this point." The reason for this is explained as follows:—The surface is exposed to the action of the air and sunlight which allow the bacteria in the soil to work more freely and at the same time allows chemical action to take place, thus rendering more plant food available for the benefit of the crop. The subsequent working needs to be carefully and thoroughly carried out and the land only worked when it is in a fit state, for much of the soil in this district if worked when too wet will get out of condition.

There is also a danger of working the red land down too fine, which causes it to run together after rain. Therefore it is necessary to keep the surface rather rough and lumpy to prevent this.

MANURING.

Manuring is recognised as an important factor in the growing of a successful crop, for in order to grow a strong healthy plant able to resist diseases the young plant must have a good supply of plant food near at hand. We now know that we only have to supply one manurial constituent in this district to grow wheat crops successfully. This statement is supported by the results, which are tabulated below:—

	Years.	No Manure.		1cwt. Super. per Acre.		2cwts. Super. per Acre.	
		B.	L.	B.	L.	B.	L.
Roseworthy	22	14	6	18	0	18	58
Longerenong (Vic.)	18	31	48	36	30	37	48
Salisbury (Vic.)	11	31	12	33	48	33	36
Booborowie	13	19	32	26	22	28	6
	64	24	29	28	40	29	39

All these results show the advantage of the use of heavy dressings of superphosphate with the exception of Salisbury (Vic.) which will, however, show a margin of profit provided the price of wheat is 3s. 9d. per bushel. However, it must not be forgotten that the use of heavy dressings of superphosphate increases the grazing. It is difficult to express this increase in figures, but all will admit that the benefits are real.

It must be remembered that where heavy yields are expected heavy dressings of fertiliser are needed. Phosphatic manures stimulate the wheat plant and ensures a good strong vigorous root system, which means stronger and more vigorous growth. The effect of heavy dressings of superphosphate in adverse seasons is well demonstrated from the following figures which were compiled in the Roseworthy College Report in 1930; all plots were treated with 2cwts. superphosphate per acre.

	Grain Increase.	Hay Increase.
Roseworthy College—	%	%
Seasons above the average (7), 1905, 1908, 1909, 1915, 1916, 1917, 1920	33·3	30·2
Normal seasons (8), 1906, 1910, 1918, 1921, 1922, 1924, 1925, 1926	34·0	27·7
Seasons below average (4), 1907, 1911, 1912, 1927	51·3	40·6
Seasons much below average (4), 1913, 1914, 1919, 1926	89·6	64·5
Booborowie Experimental Farm—		
Wet years (7 years), 1916, 1917, 1920, 1921, 1922, 1923, 1924	27·9	
Dry years (6 years), 1918, 1919, 1925, 1926, 1927, 1928	55·2	

These figures show a definite advantage, but if the figures were shown for some other districts the difference would be much more marked indeed. However, I have endeavored to produce figures which are applicable to conditions at Tatiara. Here, there is something in common with Booborowie for in the latter the soil is a heavy type with 19.40in. of rain annually, and these figures should be a useful basis of comparison for the red land in this district. It is well known that the use of superphosphate tends to ripen crops earlier, and the results at Roseworthy are very interesting on this point. Over a period of 23 years the crops grown without manure took 159.8 days to ripen their grain from germination, whilst those plots treated with 2cwts. of superphosphate per acre took only 156 days. The difference in time between germination and full bloom on unmanured plots was 114.5 days, and on 2cwts. superphosphate plots, 111.5 days. The number of days from full bloom to ripening were, no manure, 45.3 days, and 2cwts. superphosphate, 44.5 days. So it will be seen that the effect is to hasten the flowering stage by 3.8 days and the ripening stage by nearly a day. Statements that heavier dressings affected the size of the grain were not borne out by the most careful examinations.

VARIETIES.

This is an important factor, and the selection of the most suitable varieties can only be ascertained by growing new ones alongside those varieties which have proved to yield satisfactorily. Here, where Federation has proved so suitable, it will be a good guide to look for such varieties that have the same blood, other things being equal. In the Tatiara district, which enjoys a good rainfall and a heavy soil, mid season varieties should prove most suitable for general purposes.

The variety tests at Mr. W. Gill's property, Keith, are interesting:—

Variety.	1925.		1929.		Means.	
	B.	L.	B.	L.	B.	L.
Bena	30	20	29	13	29	47
Sultan	24	31	26	36	25	34
Dan	20	19	27	27	23	53
Major	21	1	26	9	23	35
Federation	17	54	28	44	23	19
Late Gluyas	19	54	24	20	22	7

In 1930 Late Gluyas was discarded and Gallipoli substituted, and this variety has yielded very well indeed.

The following varieties should be worthy of a trial under these conditions:—

Sepoy—Currawa x (Indian 4 x Federation).
Gallipoli—Clubhead x Yandilla King.
Nizam—Indian 17 x Federation.
Dan—Daphne x Faun.
Sword—Sultan x Ford.
Ghurka—Yandilla x Zaff.
Bena—Hard Federation x Marshall's No. 3.
Federation—Yandilla x Purple Straw.

Mr. R. Wiese's results, at Mundalla, show in favor of Huff's Imperial, and this variety is quite a useful one for this district, but owing to its liability to disease, it is not advisable to depend on it alone.

Immunity to disease should be one of the main factors to be taken into consideration when choosing suitable varieties. This aspect should engage more attention from the grower than has been the case in the past. For the yield, on which revenue depends, is controlled by the health and vigor of the individual plant, thus a variety which resists attacks of rust, take-all, flag smut, foot rot, eel worms, &c., will be the most valuable and profitable. So far we have not been able to ascertain any economic method of dealing with these troubles other than the use of such varieties. Flag smut has largely been responsible for displacing Federation because this variety is very susceptible to that disease.

RATE OF SEEDING.

Some rather interesting work has been done in Victoria at Werribee regarding the germination of wheat where it was found that a pound of graded wheat contained 11,000 grains or 660,000 grains per bushel. Seeding at the rate of 55lbs. per acre sows about 8 grains per foot. Seeding at rate of 80-85lbs. sows 12 grains per foot. Observations were noted that when conditions were favorable 80-90 per cent. of the grain sown germinates, but when conditions were unfavorable the germination may be down as low as only 15 per cent. in yield where the land is water logged, &c. This low germination, as can be imagined, gives the crop a very patchy appearance. The amount to sow locally will be greater than would be recommended for the dry district such as the mallee areas, &c.

It has been usual to sow 70-80lbs. of seed per acre in this district This was probably ascertained from the results over the border, because at Longerenong 70-80lbs. seed appears to be the most profitable amount to use when combined with late sowing, as the following figures show over a 10 year period, 1915-1924:—

Federation Wheat.	Lbs. Seed Used per Acre.				
	45	60	76	90	120
Early sown .... (bush)	39·8	42·3	43·8	41·7	41·8
Late sown .... (bush)	45·0	45·5	48·5	48·6	47·6
Difference in favor of late seeding (bush)	5·2	3·2	5·0	6·9	5·8

However, later results have shown that a change in the time of seeding has proved more successful, and this is probably due to dry springs and changed cultural methods at Longerenong.

	Lbs. Seed Used per Acre.			
	45	60	76	90
Early sown .... (bush)	38·5	39·45	38·7	39·65
Late sown .... (bush)	31·1	32·25	31 8	32·65
Difference in favor of early seeding..... (bush)	7·4	7·2	6·9	7·0

From the above figures, the best time to sow would therefore be the end of May or early June, varying with the season. With difficult land to seed it is necessary to have everything ready at the right time so that the seed can be put in when the weather conditions are favorable, and from the above figures 1bush. of good graded seed should be sufficient.

Clean Seed.

Use only clean graded seed which is free from weed seeds, also free from loose smut It might be well to mention this disease, which is very common in the district. There is no practical method of controlling it; therefore secure seed that is free from it for next year's crop. The use of the grader worked according to instructions by the manufacturer will ensure the sowing of only good, well filled, plump grains, which should produce a good, strong, healthy plant and give a good return of plump grain. Graded seed has frequently been tested alongside ungraded seed, and as much as 4bush. per acre have been obtained in favor of the graded seed. Then, further, small and cracked grains may be used for feeding to livestock.

Pickling.

Care should be exercised to see that pickling for bunt is carefully and thoroughly carried out. The bunt spores are very small, and it is estimated that there are 6,000,000 in one ball, or 2,000-3,000 spores would be required if placed side by side to measure one inch. Since there are 660,000 grains in a bushel of wheat, so there are approximately 10 bunt spores for each grain of wheat in each 60lbs. If you can see or smell smut use formalin ¼ per cent., or 1lb. to 40galls. of water, or a 1 per cent. solution of bluestone, *i.e.*, 1lb. bluestone to 10galls. of water. If copper carbonate is used 1½-2ozs. are needed to each bushel of wheat. However, whatever method is adopted it is necessary to make sure that each grain is thoroughly covered with the fungicide used. Then take care that the grains so treated are put into clean bags in order to prevent re-infection.

Rotation of Crops.

It is now recognised that it is not good husbandry to continue growing the same crop year after year in the same field. This practice is adopted, of course, in all new districts, mainly because of lack of knowledge. It narrows down the markets and also reduces the amount of machinery required. However, sooner or later, Nature sees to it that a change is made, for we find that the crops fall off in yield due to lack of plant food. This is usually accompanied by various diseases and thus we are forced to adopt some form of rotation in order to secure satisfactory returns. Here we find such diseases as foot rot, take-all, flag smut, and eel worm, and when they appear it is necessary to grow some other crop than wheat in order to keep them in check.

Besides this, the keeping of livestock—either sheep or cattle—always adds materially to the profits from wheat farms, and to maintain them successfully it is necessary to grow such crops as oats and barley. If we again turn to the Booborowie Farm results we find that where oats are used to follow the wheat crops, the returns are higher and more profitable than where barley is used. There barefallow, wheat, oats, and pasture give the most profitable returns. However, barley will probably give better returns in this district, for in the three course rotation at Booborowie, barley returns are 16bush. 13lbs. From these results it would appear that a three or four rotation should prove profitable, such as—

Barefallow—wheat—oats.
Barefallow—wheat—oats—pasture.
Barefallow—wheat—oats—rye grass.
Barefallow—wheat—barley—pasture.
Barefallow—wheat—barley—rye grass.

In this district barley would yield better than at Booborowie, and should be profitable. The introduction of Wimmera Rye Grass should improve the grazing returns very materially.

DISEASES.

Bunt has been dealt with earlier. Take-all (*Ophiobolus graminis*), *Wojnowicia graminis,* and *Helminthosporium sativum*; these are fungus diseases which live on the young growing tissues of the young plants and cause a stunted early matured appearance. They are capable of killing the plants at all stages of growth. They are identified in the paddock by the black discoloration at the base of the straw. Control measures are to burn all stubble from affected fields, including headlands, as many of our grasses are attacked by these diseases and are responsible for carrying them over from year to year. Early fallowing encourages the spores to germinate before the crop is sown and thus they are starved for want of host plants. Rotation of crops, growing oats (which are immune to these particular diseases), and sowing only on well prepared seedbeds which encourage strong healthy vigorous growth, are advisable. Liberal applications of superphosphate also assist in this direction and promote strong healthy plants able to resist disease.

Eelworms.—This trouble has been reported in the district, and in some years is responsible for reduced yields. As with most cereal diseases the plants are usually seriously affected before the landholder realises it, and until recently it was not recognised how widespread the diseases were in this State. The first signs are generally a thinning out of the plants. The affected plants are poorly grown and have a general ill-nourished appearance, similar to "no growth," although the trouble now known as "no growth" is not the same as an eelworm attack. If plants affected by eelworms are pulled up it will be noticed that the roots are very abnormal and more or less matted or knotted. Then later in the season the white cysts of the female insects will be noticed adhering to the roots. The rooting system is also very shallow, and this has a detrimental effect on the plant, especially late in season.

Control Measures.—As eelworms have only recently been found in South Australia not much is known regarding the trouble, but the following suggestions are recommended:—

1. Good cultivation to ensure that the plant grows vigorously and, to assist, liberal fertilising is advised.

2. Rotation is also suggested, but since other cereals are affected it is a matter of observation to find some which will be more or less immune.
3. Use of resistance varieties.

To Summarise the Main Points.

1. Plough and fallow early, not more than 3-4in. deep, in July and August.
2. Cultivate when necessary to check weeds and prevent crust forming on surface; cultivation should aim at forming a good seedbed.
3. Give a liberal dressing of fertiliser—1-2cwts. per acre—to ensure strong vigorous growth.
4. Use suitable varieties—Gallipoli, Ghurka, Bena, Ranee, Sword.
5. Use good clean graded seed at the rate of 60-70lbs. per acre.
6. Sow at end May or early June.
7. Pickle seed carefully and thoroughly.
8. Practise some form of rotation.

TATIARA FALLOW COMPETITION, 1933.

[Judged by E. S. Alcock, District Agricultural Instructor.]

Position.	Name and Address.	Compactness of Underlayers.	Condition of Seedbed.	Mulch.		Freedom from Weeds.	Total.
				Condition Suitability.	Depth.		
	Maxima—	25	15	15	20	25	100
1	H. C. M. Pilgrim, Wolseley	24	14	13	17	24	92
2	E. Norton, Wolseley	23	14	12	17	24	90
2	E. W. Sharrad, Wolseley ..	22	13	13	18	24	90
4	F. B. Milne, Bordertown ..	22	12	12	17	23	86
5	Percy Grosser, Wolseley ...	22	12	11	17	21	83
6	A. G. Butler, Wolseley	20	12	11	16	23	82
7	R. A. Grosser (1), Wolseley.	20	12	11	15	23	81
8	R. A. Grosser (2), Wolseley	19	11	11	16	20	77

In commenting on the winning entry, Mr. Alcock said the 50 acres exhibited by Mr. Pilgrim consisted of a fine paddock of grey land, very clean and free from trees and stumps. The under layers were well consolidated, and the soil contained more moisture than most of the other entries. The seedbed was exceptionally even and regular, and showed evidence of a few weed seeds germinating. The mulch was rather fine, due to the use of harrows and rather shallow in depth—1½in. to 2in., but very clean and free from weeds. The paddock was ploughed 3½in. deep in April, worked with a springtooth towards the end of July, scarified in October, and harrowed twice early in March and again during the first week in April.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1933-34.

SECTION 1.—WHITE LEGHORNS.

Competitor.	Address.	Score to Month ending April 30th, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
E. F. Ashmeade	398, Magill Road, Kensington Park	(1) 7	(2) 2	(3) 7	16
L. R. Badcock	77, Findon Rd., Woodville	(4) 7	(5) 4	(6) 6	17
C. J. C. Burton	Mallala	(7) 12	(8) 12	(9) 15	39
C. J. C. Burton	Mallala	(10) 10	(11) 9	(12) 6	25
W. A. Carter	2, Grosvenor St., Glandore	(13) 9	(14) 14	(15) 1	24
W. A. Carter	2, Grosvenor St., Glandore	(16) 12	(17) 11	(18) 4	27
B. Cooke	Kanmantoo	(19) 13	(20) 8	(21) 8	29
H. F. Cox	Samson Road, Glanville Blocks	(22) 9	(23) 5	(24) 6	20
H. F. Cox	Samson Road, Glanville Blocks	(25) 10	(26) 13	(27) 7	30
L. H. Crawford	Military Road, Grange	(28) 6	(29) 9	(30) 9	24
L. H. Crawford	Military Road, Grange	(31) 3	(32) 1	(33) 10	14
R. C. Crittenden	William Street, Kilkenny North	(34) 8	(35) 10	(36) 10	28
Chas. H. Day	Box 28, Salisbury	(37) 10	(38) 5	(39) 8	23
J. H. Dowling	Glossop	(40) 7	(41) 2	(42) 5	14
T. Duhring	Mallala	(43) 10	(44) 10	(45) 1	21
T. Duhring	Mallala	(46) —	(47) —	(48) —	—
H. Fidge	313, Cross Roads, Clarence Park	(49) 10	(50) —	(51) 2	12
V. F. Gameau	Findon Road, Woodville	(52) 1	(53) 4	(54) 6	11
W. Chas. Slape	Magill Road, Magill	(55) 3	(56) 14	(57) 13	30
G. C. Gavin	Salisbury	(58) 5	(59) 3	(60) 4	12
G. C. Gavin	Salisbury	(61) 14	(62) 15	(63) 5	34
H. H. Hefford	McHenry Street, Murray Bridge	(64) 6	(65) 5	(66) —	11
H. H. Hefford	McHenry Street, Murray Bridge	(67) 16	(68) 1	(69) 6	23
W. H. A. Hodgson	Commercial Rd., Salisbury	(70) 5	(71) 5	(72) 5	15
W. H. A. Hodgson	Commercal Rd., Salisbury	(73) 3	(74) 5	(75) 6	14
E. A. Lamerton	Cross Roads, Edwardstown	(76) 3	(77) 10	(78) 14	27
C. H. Lines, jun.	Box 75, Gladstone	(79) 7	(80) 16	(81) 1	24
C. H. Lines, jun.	Box 75, Gladstone	(82) 5	(83) —	(84) 3	8
V. F. Gameau	Findon Road, Woodville	(85) 1	(86) —	(87) 7	8
L. A. G. Pitt	24, John Street, Payneham	(88) 8	(89) 1	(90) 13	22
L. A. G. Pitt	24, John Street, Payneham	(91) 7	(92) 6	(93) 7	20
H. A. Rasmussen	Swan Terrace, Ethelton	(94) 12	(95) 7	(96) 13	32
H. A. Rasmussen	Swan Terrace, Ethelton	(97) 9	(98) 11	(99) 14	34
S. E. Reedman	51, Gilbert Street, Gilberton	(100) 17	(101) 14	(102) 11	42
Bruce Rowe	"St. Kevern," Two Wells	(103) 11	(104) 5	(105) 13	29
Bruce Rowe	"St. Kevern," Two Wells	(106) 7	(107) 5	(108) 5	17
H. J. Stacey	Uraidla	(109) 1	(110) 6	(111) 6	13
H. J. Stacey	Uraidla	(112) 2	(113) 2	(114) 1	5
Thomas & Elson	53, Clifton Street, Hawthorn	(115) 8	(116) 2	(117) 8	18
Thomas & Elson	53, Clifton Street, Hawthorn	(118) 7	(119) 3	(120) 5	15
H. L. Twartz	Gawler	(121) 9	(122) 10	(123) 13	32
H. L. Twartz	Gawler	(124) 3	(125) 4	(126) 8	15
F. F. Welford	1, Ludgate Circus, Colonel Light Gardens	(127) 10	(128) 19	(129) 7	36
F. F. Welford	1, Ludgate Circus, Colonel Light Gardens	(130) 9	(131) 8	(132) 3	20

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitor.	Address.	Score to Month ending April 30th, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
A. P. Urlwin	Box 80, Balaklava	(133) 2	(134) 16	(135) 5	23
A. W. Dawes	230, Portrush Road, Glenunga Gardens	(136) 11	(137) 1	(138) 8	20
Total—Section 1		—	—	—	973
SECTION 2—ANY OTHER LIGHT BREEDS.					
V. F. Gameau	Findon Road, Woodville (Minorcas)	(139) 7	(140) —	(141) —	7
M. O. and C. A. Roberts	Torrens Road, Kilkenny (Minorcas)	(142) 1	(143) 8	(144) —	9
Total—Section 2		—	—	—	16
SECTION 3—BLACK ORPINGTONS.					
Arthur Cook	187, Goodwood Road, Colonel Light Gardens	(145) 14	(146) 18	(147) 10	42
B. Cooke	Kanmantoo	(148) 22	(149) 9	(150) 15	46
L. H. Crawford	Military Road, Grange	(151) 5	(152) 2	(153) 9	16
L. H. Crawford	Military Road, Grange	(154) 2	(155) 3	(156) 13	18
Les. Darcy	Mypolonga	(157) 12	(158) 4	(159) 11	27
Les. Darcy	Mypolonga	(160) 5	(161) 12	(162) 3	20
J. H. Dowling	Glossop	(163) —	(164) 2	(165) —	2
H. Fidge	313, Cross Rds., Clarence Pk.	(166) 7	(167) 5	(168) —	12
H. H. Hefford	McHenry Street, Murray Bridge	(169) —	(170) —	(171) 9	9
F. J. Hudson	54, Willcox Av., Prospect	(172) 8	(173) 22	(174) 7	37
A. G. Dawes	230, Portrush Road, Glenunga Gardens	(175) 9	(176) 18	(177) 1	28
C. H. Lines, jun.	Box 75, Gladstone	(178) 1	(179) 1	(180) 1	3
C. H. Lines, jun.	Box 75, Gladstone	(181) 1	(182) 2	(183) 2	5
H. J. Mills	Edward St., Edwardstown	(184) 2	(185) 12	(186) 11	25
H. J. Mills	Edward St., Edwardstown	(187) 11	(188) —	(189) —	11
J. Rawe	Honeyton St., Seaton Pk.	(190) 10	(191) —	(192) —	10
S. E. Reedman	51, Gilbert St., Gilberton.	(193) 9	(194) 4	(195) 18	31
S. E. Reedman	51, Gilbert St., Gilberton.	(196) 2	(197) 3	(198) 11	16
H. L. Twartz	Gawler	(199) 7	(200) 17	(201) 1	25
A. G. Dawes	230, Portrush Road, Glenunga Gardens	(202) 8	(203) 17	(204) 14	39
N. F. Richardson	60, Beaufort St., Woodville Park, Kilkenny	(205) 23	(206) 9	(207) 8	40
W. H. L. Wittenberg	3, Rushton St., Goodwood	(208) 18	(209) 13	(210) 4	35
W. H. L. Wittenberg	3, Rushton St., Goodwood	(211) 8	(212) 17	(213) 16	41
W. Woodley	Tailem Bend	(214) —	(215) —	(216) —	—
W. Woodley	Tailem Bend	(217) —	(218) —	(219) —	—
Total—Section 3		—	—	—	538
SECTION 4—ANY OTHER HEAVY BREED.					
H. Fidge	313, Cross Roads, Clarence Park (Rhode Is. Reds)	(220) —	(221) —	(222) —	—
V. F. Gameau	Findon Road, Woodville (Rhode Island Reds)	(223) 5	(224) —	(225) 5	5
V. F. Gameau	Findon Road, Woodville (Rhode Island Reds)	2(226) —	(227) —	(228) —	—
H. J. Mills	Edward St., Edwardstown (Rhode Island Reds)	(229) 16	(230) 7	(231) —	23
W. R. Williams	28, Avenue Rd., Frewville (Rhode Island Reds)	(232) 7	(233) 10	(234) 3	20
W. R. Williams	28, Avenue Rd., Frewville (Rhode Island Reds)	(235) 17	(236) 17	(237) 16	50
Bruce Rowe	"St. Kevern," Two Wells (Barnevelders)	(238) —	(239) —	(240) —	—
Bruce Rowe	"St. Kevern," Two Wells (Welsumers)	(241) —	(242) —	(243) —	—
Total—Section 4		—	—	—	98

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during March.	Per Cow during March.	Per Cow July to March.	Per Herd during March.	Per Cow during March.	Per Cow July to March.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E .	27	23·23	12,152½	450·09	5,396·54	485·08	17·97	219·51	3·99
7/H .	9	8·29	4,767½	529·72	5,333·80	247·10	27·46	269·60	5·18
7/K .	19·90	12·10	9,275½	466·32	6,624·20	379·72	19·09	278·80	4·09
7/L .	36	30·06	17,653½	490·37	5,490·54	841·28	23·37	258·90	4·77
7/T .	14	11·94	3,585	256·07	4,453·30	190·52	13·61	204·46	5·31
7/W .	19	15·81	9,044	476·00	5,854·87	379·54	19·98	245·30	4·20
7/Y .	27	24·10	11,166	413·56	5,291·37	546·16	20·23	248·42	4·89
7/Aa	14	11·68	3,633½	259·53	4,518·85	188·15	13·44	220·51	5·18
7/Hh	18	17·71	5,581½	310·08	4,752·79	266·60	14·81	207·17	4·78
7/Kk	19	17·52	10,107½	531·97	5,891·26	465·19	24·48	249·52	4·60
7/Mm	37	29·58	16,636	449·62	6,369·29	684·47	18·50	249·26	4·12
7/Nn	23·29	16·68	7 979½	342·61	5,777·85	330·26	14·18	227·41	4·14
7/Oo	16	13·32	6,985	436·56	5,840·64	361·07	22·57	276·56	5·17
7/Pp	19	17·23	9,319½	490·50	5,877·48	510·77	26·88	317·10	5·48
7/Qq	15·87	14	7,436½	468·59	4,536·87	431·87	27·21	254·43	5·81
7/Tt	18·61	16·55	10,708½	575·41	5,818·83	468·61	25·18	260·54	4·38
7/Uu	22·90	18·87	6,088½	265·87	4,857·05	264·68	11·56	220·96	4·35
7/Vv	13·61	9·74	5,234	384·56	6,029·43	266·48	19·58	296·65	5·09
7/Xx	22	19·48	11,635½	528·88	6,534·23	675·51	30·71	359·61	5·81
7/Yy	20·94	19·52	7,704	367·90	4,408·90	363·75	17·37	200·18	5·02
Means	20·61	17·35	8,834·68	428·74	5,467·79	417·36	20·25	248·43	4·72

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during March.	Per Cow during March.	Per Cow October to March.	Per Herd during March.	Per Cow during March.	Per Cow October to March.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	32·84	24·45	14,243½	433·72	3,438·73	742·24	22·60	177·20	5·21
5/D .	30·06	19·94	12,365½	411·36	3,370·82	648·55	21·57	183·19	5·24
5/E .	40·06	24·03	9,394	234·49	2,857·15	504·92	12·60	154·00	5·37
5/P .	31·06	22·48	15,062½	484·94	3,435·84	778·01	25·05	169·73	5·17
5/R .	70·68	47·45	12,495	176·78	2,202·03	530·65	7·51	91·49	4·25
5/S ..	19·35	10·45	4,620½	238·78	2,255·73	232·60	12·02	110·27	5·03
5/Y .	26	20·68	12,326	474·88	3,338·98	683·06	26·32	173·74	5·58
5/Z ..	38·27	33·74	26,628	695·79	3,910·47	1,263·09	33·00	186·80	4·74
5/Ee	19	17	8,447½	444·61	4,330·92	476·28	25·07	215·52	5·64
5/Gg	23	17·58	6,765½	294·15	2,271·75	360·08	15·65	109·28	5·32
5/Ii .	31	25·55	13,441	433·61	3,567·67	711·81	22·97	175·77	5·29
5/Jj .	24·35	15	6,883½	282·69	3,583·84	321·57	13·21	154·22	4·67
5/Kk	20·26	17·94	10,766	531·39	2,880·21	512·43	25·29	131·00	4·76
5/Nn .	24·48	23·16	9,425½	385·02	3,823·52	485·71	19·84	180·06	5·15
5/Oo	21	20	8,695½	414·07	3,452·21	410·76	19·56	157·42	4·72
5/Qq	19·81	15·23	8,721	440·23	2,768·08	500·65	25·27	151·41	5·74
5/Rr	23	11·68	4,024½	174·98	1,886·12	202·39	8·80	107·97	5·03
5/Ss	20·23	11·58	4,848½	239·66	3,183·49	230·89	11·41	147·24	4·76
5/Tt	12	10	4,169½	347·46	3,610·88	217·39	18·12	187·47	5·21
5/Uu	21·29	19·52	7,136½	335·20	2,629·52	357·15	16·78	119·69	5·00
5/Vv	21·90	13·13	13,382	611·05	3,030·14	603·02	27·54	136·20	4·51
Means	27·13	20·03	10,182·93	375·40	3,072·32	513·01	18·91	149·88	5·04

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MARCH, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during March.	Per Cow during March.	Per Cow December to March.	Per Herd during March.	Per Cow during March.	Per Cow December to March.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B .	19	10·48	4,858½	255·71	1,315·51	219·49	11·55	62·42	4·52
6/C .	18	13·87	7,334½	407·47	2,272·12	328·49	18·25	103·06	4·48
6/F .	24	16·35	12,551½	522·98	1,953·42	683·29	28·47	101·51	5·44
6/H .	26	18·26	7,381½	281·48	1,937·96	379·72	14·60	96·65	5·19
6/Y .	13	10·48	4,752	365·54	1,955·10	210·58	16·20	87·23	4·43
6/Ii .	30	26·65	19,807½	660·25	2,648·30	833·82	27·79	113·49	4·21
6/Ll	21·13	16·32	14,597½	690·84	2,384·01	554·75	26·25	93·85	3·80
6/Oo	18·35	18·35	16,795	915·26	3,614·36	722·27	39·36	160·50	4·30
6/Pp	15	10·90	7,729	515·27	1,954·80	361·41	24·09	94·37	4·68
6/Qq	24	21·48	19,836	826·50	3,615·16	880·86	36·70	154·76	4·44
6/Rr	29	27·81	20,878	719·93	3,266·21	913·16	31·49	140·25	4·37
6/Tt	22	17·90	12,954½	588·84	2,762·35	601·01	27·32	122·77	4·64
6/Vv	21	19·19	12,773½	608·26	3,135·42	654·87	31·18	147·01	5·13
6/Xx	23	19·42	14,183½	616·67	2,839·73	592·71	25·77	117·98	4·18
6/Yy	30·87	20·52	13,458½	435·97	1,869·76	700·35	22·69	94·38	5·20
6/Zz	27·61	22·77	18,724	678·16	2,971·74	832·71	30·16	130·93	4·45
6/Aaa	20	11·39	1,732	86·60	917·42	103·98	5·20	51·16	6·00
6/Bbb	26·94	21·97	18,778½	697·05	2,996·10	732·07	27·17	121·62	3·90
6/Ccc	18·13	17·55	11,210½	618·34	2,711·11	482·31	26·60	113·65	4·30
6/Ddd	23	21·97	16,376½	712·02	2,924·96	695·46	30·24	126·97	4·25
6/Eee	26·45	21·74	18,161	686·61	3,465·69	807·54	30·53	144·28	4·45
6/Fff	27	22	19,592	725·63	3,217·72	831·99	30·81	135·33	4·25
6/Ggg	26	25·39	24,623½	947·06	3,569·52	939·03	36·12	143·96	3·81
Means	23·02	18·82	13,870·70	602·53	2,651·58	611·38	26·56	116·79	4·41

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THE AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

DAIRY CONFERENCE AT MOUNT BARKER.

The second Annual Conference of Branches of the Agricultural Bureau, organised to discuss problems connected with the dairying industry, was held at Mount Barker on Thursday, May 11th, 1933. Mr. A. E. Hunt (Chairman of Mount Barker Branch) presided. Messrs. P. Baily (Member of Advisory Board of Agriculture), L. Cowan, B.Sc. (Council, Roseworthy Agricultural College), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), C. McKenna, B.V.Sc. (Government Veterinary Officer), R. Baker (Dairy Instructor, Roseworthy Agricultural College), H. J. Apps (Senior Dairy Instructor), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary) attended on behalf of the Department of Agriculture.

Delegates were present from the Jervois, Milang, Mount Barker, Narrung, Currency Creek, Tweedvale, Murray Bridge, Hartley, Macclesfield, Longwood, Lyndoch, and Adelaide Branches.

Mr. Baily delivered the opening address. The following papers were read, and aroused instructive discussions:—"Stock Troubles," Mr. P. Wise (Meat Inspector, Mount Barker); "Fodders for Southern Districts," Mr. B. Stephenson, Mount Barker; "General Management of Dairy Cows." Mr. B. Casley, Milang.

Departmental officers replied to numerous questions, and the Conference adopted the following resolutions:—"That the 1934 Conference be held at Milang." "That this Annual Conference of Branches of the Agricultural Bureau reaffirm its resolution, passed at the 1932 Conference, that it is highly desirable that a cattle compensation fund similar to the Victorian fund be established without delay in this State by Act of Parliament." "In the interest of human life, all *bulls* in dairy herds should be *dehorned*, and that it be a request to the Advisory Board of Agriculture that the Board bring this resolution to the notice of the Royal Agricultural Society, together with a suggestion that judges at the Society's Show should not allow any points for a bull's horns when judging dairy bulls." "In the interests of the dairying industry, that an *Advisory Board of Dairying* be appointed, separate from the Advisory Board of Agriculture, to deal with matters arising from Bureaux and Conferences." "That this Conference again asks that the Dairy Industry Act, 1928, be amended to compel all factories to pay for all cream according to grade on a deferential basis."

DESTROYING COUCH GRASS ON FALLOW.

Asking for the best method of destroying couch grass on fallow, the Frayville Branch of the Agricultural Bureau has been advised by the Supervisor of Experimental Work (Mr. R. C. Scott) that for small areas, such as gardens, the best method of eradicating couch grass is hand-digging and removing all material. Any portion of stem left behind will commence new growth. It is not likely that the weed will be completely eradicated in one operation, and consequently close attention must be given and the new growth dug out as it appears. However, provided that the first removal is thorough, later treatments will not be difficult.

Where the infestation covers larger areas and extends into farm fields, hand-digging is not practicable. In this case, eradication is more difficult, but the weed may be kept fairly well under control by cultivation.

Couch grass is more or less dormant throughout the winter months, and therefore tillage must be given in the summer time. The stems are exposed to the warm sun, and provided they are not protected by earth, they quickly die. Consequently, it is an advantage to follow the cultivator with the harrows to drag them to the surface, and as soon as possible burn off the heaps of couch grass roots.

PAPERS READ AT CONFERENCES.

MOUNT BARKER DAIRY CONFERENCE, MAY 11TH, 1933.

GENERAL MANAGEMENT OF DAIRY COWS.

[By B. N. Casley, Milang.]

The system of management largely depends on the method of disposal of the milk, *i.e.*, whether sold as new milk or made into butter or cheese, and naturally the method selected will be that which is expected to give the greatest net profit.

In addition, the position of the farm in relation to markets, the nature of the soil, the altitude and climate, and the buildings, all influence to some extent the suitability of a farm for any particular purpose, and as these factors are very variable, there must be many exceptions to any method of classification.

Cows should at all times be quietly and gently treated. Hurried driving in and out of gates and doors, chasing by dogs, beating with a stick or milking stool, are objectionable in every way, and should not be tolerated. A cow in milk must have time to eat, chew, and digest her food in comfort, and rough treatment not only interferes with digestion, but also disturbs the nervous system which more or less controls the action of the milk-making glands, and thus lessen the milk yield.

Gentle treatment should begin with the calf, when dehorning should take place, and be continued with the yearling and in-calf heifer; where it is customary to approach and handle young stock at all ages there will be no difficulty in the management and milking of a newly-calved heifer, her milk yield will be increased, and much time will be saved.

The keeping of a record of the milk yielded by each cow, by weighing the milk produced at regular convenient intervals, should be part of the management of every dairy herd. The experience of many farmers has shown that milk-recording is the basis of successful dairy farming.

These records—supplemented by records of the percentage of fat in the milk of each cow—provide the information which shows which cows should be sold, because of their low yields, and which should be kept and bred from; further, recording introduces business methods, and when these are found instrumental in making for more profit, the urge is towards the introduction of better methods in every branch of farm work. Careful records should be kept of the date of service, when due, and actual date of calving. Such records are needful when drying off if the cow is to have a rest before freshening; this period of rest varies according to circumstances, but at least two months are beneficial for a cow producing 300lb. fat. In the ordinary dairy herd it is customary for cows to freshen once a year. Under such conditions the average length of the lactation period is 43 weeks, but the length of the lactation period of each cow is also influenced by the cow's inherent milking capacity, and by the season of the year when she calves. A study of production records shows that cows calving from January to April give more than cows calving from August to November, because the advent of fresh grass after the cows have been in milk several months increases the yield and causes a second flush of milk.

The individual cows in a herd are usually named or numbered, but the recording of production work and grading up of stock for entry into breed herd books has shown the need for a definite system of identification of animals by tattooing a number in the ear.

Cows are creatures of habit, and changes from their accustomed routine lead to a lessened milk yield. So far as possible, a definite time table should be adhered to in the daily work of milking and feeding.

The aim of the farmer in feeding should be to give an appetising, balanced, and economical diet, which should be first a "maintenance part" and second a "production part," the quantity of the latter to vary according to milk yield.

The simplest method of feeding according to milk yield is to give uniform qualities of bulky foods to all cows for the maintenance part, then prepare a production mixture of concentrates and minerals. In the feeding of heavy milkers, it is desirable to provide a mixture of greater variety of concentrates, watching always for signs of over-feeding when the concentrate allowance should be reduced and a laxative mash given.

The dairyman should always be the best judge, guided by the records and the condition of the cows as to when the pasture requires to be supplemented.

Milking should always be carried out as quickly and thoroughly as possible. Quick milking gives increased returns. Thorough milking means careful stripping, because strippings are very rich in fat.

A good keeping, wholesome article of good flavor and quality can only be produced if the milk itself is clean. The essentials in the chain of operations from the cow to the consumer, so far as the producer is concerned, are: *Clean cows,* particularly as regards udder and teats, which should be washed before milking; *clean utensils*—buckets, cans, separator, cooler, &c.—which should be well washed after using; *cooling* the milk or cream to as low a temperature as possible in a clean room immediately, and keeping the milk or cream cool in a clean place until dispatched from the farm.

At all times careful watch should be kept for signs of sickness, probably the most common ailment in our midst is caused through a deficiency of minerals in the feeds—very noticeable during a dry summer. When it is considered what a cow needs in minerals to produce a calf and to milk to capacity, the urgent need to supply what is lacking is apaprent.

FODDERS FOR SOUTHERN DISTRICTS.

[By B. STEPHENSON, Mount Barker.]

Whilst it is intended to deal chiefly with fodders which are annuals, and which are planted to give a supply of green feed for the summer months, no paper on greenstuffs would be complete without some reference to Lucerne.

Climatic conditions differ so that what may give good results in one district would be a failure in another. For instance, lucerne does not do well at Mount Barker if sown in the autumn or with a cover crop. The main thing is to give it a good start; therefore thoroughly plough and cultivate the land, to free it from weeds and to conserve the moisture. Do not sow the seed until October, as the flea is generally bad up to the middle of that month, and the young lucerne will disappear as soon as it shows through the ground. This may perhaps seem rather late, but if the land has been well prepared and a showery day selected for seeding, the quickness of germination and young growth is wonderful.

If possible, and not too expensive, the land should be well limed some time previous to sowing, and also a liberal quantity of super or bonedust applied when putting in the crop. At first thought this may appear rather a costly job, but when one considers the time that this crop will last—lucerne has been grown without any resowing for 34 years in the Mount Barker district—it will be admitted that it well repays the cost.

Method of Sowing.—If drilled in, mix the quantity of seed per acre with the amount of super per acre thoroughly, and cover lightly. If broadcast, the method I adopt is to mix the seed as above, and sit on the back of the roller, with my back to the horses and seed lip on my knees. I can then sow double-handed, and after the first round the driver—who, of course, is walking—can gauge the distance or width to miss. In this way it is possible to make a very even sowing. After the sowing process is over a light harrowing removes the roller marks and covers the seed. A lucerne plot of six acres was sown in this manner as late as November of last year, and has given a very promising stand without irrigation, but it was a favorable season. Lucerne is valuable for grazing, for green feed and for silage, and undoubtedly has proved and earned its right to be the foremost of fodders.

SORGHUM.

There is a number of different kinds of sorghum, but of the older ones Imphee or Planter's Friend will give the best results. Sudan Grass, on account of its ''cut-and-come-again'' qualities, has proved itself the best of this family, and also one of the best of summer fodders. Of quick germination and growth, provided it is not put in too early, the first cut can be obtained in about eight or ten weeks from time of sowing, and as it stools out freely,the second growth is ready to start away directly the first is carted off. If put in well, in ground of good heart, three cuts can be expected and the fourth growth fed off in the one season.

It has not the same tendency to poison as other sorghums, is easy to cut, and if mown just at the beginning of the flowering stage, makes good hay; it also stands feeding off well. If sown too early the crop will be a failure, whereas by waiting for suitable conditions, success is generally assured. A splendid drought-resister, it will grow through hot weather when other plants are withering, provided the soil has been well prepared before sowing.

MAIZE.

Maize succeeds best in a warm deep soil, well drained, with a good capacity for retaining moisture. Rich river flats and drained swamps furnish the best conditions. As maize needs a warm soil for germinaton, if sown too early in cold ground the seed is liable to rot.

The young plants being most susceptible to frost, it is well to put off sowing until this danger is past. In this district October or early November is the most suitable time. As with all other summer crops, no amount of cultivating after the crop is planted can make up for the lack of it before; and as a fine seedbed is required, the land should be worked to a fine tilth with cultivator and harrows. The crop is at its best just as the grain is beginning to harden from the milk stage, as at this time the crop, as a whole, has its greatest nutritive value. Maize cannot be profitably grown in this district for seed, as the summer is not of long enough duration, and the first autumn frosts cause havoc in the crop.

SUNFLOWER.

This fodder is well worth a trial. The two large varieties, grey and black seeded, yield a quantity of feed in their leaves and stalks. The flower contains a large amount of honey for bees, and when the seed ripens it is greatly appreciated by poultry. Like maize, it does best in deep, rich soil, deeply ploughed, and well worked before sowing. I have tried it with maize as a mixture, and have always found that it gets right away from the maize, both in earlier germination and later growth, and is much more hardy, standing frosts that have cut the maize to ''shavings.'' It is surprising the weight of green stuff that can be grown from a small patch, and it does not take the cows long to acquire a taste for it, and if it does not increase the flow of milk, it keeps the supply from falling off.

BERSEEM OR EGYPTIAN CLOVER.

This is more of a winter fodder, but I prefer to sow it in the late summer or early autumn to give it a good start for the winter. Under irrigation in summer it produces a splendid growth of succulent green feed, easily cut with scythe or mower, and ready to show out again straight away. Apart from being a splendid fodder, berseem ranks with the best as a soil enricher, adding a quantity of nitrogen and humus to the ground, thus preparing the way for the following crop.

RAPE.

This is a fodder that should be more extensively grown. As a "topper-up" of sheep and lambs it will give splendid returns for a comparatively low outlay, putting that bloom or finish on lambs especially that attracts the eye of the buyer. It has rather a tendency to bloat stock, therefore care should be used in turning animals on it to graze. If white mustard seed is mixed with it when being sown, about 1½lb. to 2 lb. per acre, that helps to counteract any ill-effects; but as with several other fodders, while it is fresh to the stock, they should only be pastured for a short time, and not be too empty when turned in to graze. Care should be exercised to prepare the proper variety of seed; some kinds are useless and a rank pest. Broadleaf Dwarf Essex can be recommended.

I have cut rape, and after letting it wilt for a while, fed it to the milking cows, and could not detect any objectionable odor or taint, but it is best not to feed it to the stock too near milking time.

The above remarks apply also to chou moellier, with the exception that the leaves are plucked from the plant and fed to the stock. It is a good milk producer and does not taint the milk like some other plants, and can be sown from March through to October. There is a number of other members of the kale family, but this is the best from the dairyman's point of view.

SILVER BEET.

This is another valuable plant that has not been grown to the extent that it deserves. It is not a tricky crop to grow, although, as with everything else, the best results follow careful cultivation. It will stand feeding off several times, if care is taken not to let the stock remain on it so as to eat out the crown. It will last for a long time if grown under good conditions and the right variety is sown. As a fodder it is well worthy of a trial. Poultry relish it as a green picking, sheep and lambs will fatten on it, and if planted well down in the level, cows can be allowed to graze on it without much danger of eating it out, provided reasonable precautions are taken. Takes on well if transplanted in showery weather, and produces a large quantity of seed if let go to head.

ROOT CROPS.

There is a number of root crops, all of which are worthy of cultivation—mangels, swedes, turnips, field carrots, and sugar beet. *Mangels.*—Out of seven or eight varieties the Long Red and Yellow Globe seem to be the most grown. Not only does the root provide a very large quantity of food, but the leaves also, especially of the long variety, produce fodder which the cows relish and which adds greatly to the quantity of cream. It means work to grow and feed to stock a large mangel crop, but as the food comes in winter, a good root crop is a valuable asset. Last year I had a quantity of mangels still in the ground at the end of the season, and wanting that ground for another crop, I pulled them when making ensilage and put them in layers between the green stuff. They came out flat and cooked, and both the cows and pigs ate them readily. The dirt, of course, must be removed before fed to stock.

GRASSES.

Phalaris tuberosa, Prairie, Paspalum, Rye, and Kikuyu.—*Phalaris tuberosa* is the best winter grass. It is over 20 years since I first planted it and it is still going strong, and will withstand frost better than any other grass. It is not a grass suitable for hay, although it will grow high enough, but for grazing it is at its best. It also makes good silage, especially if mixed with other grasses. Prairie is a good second to the above, but will not stand such heavy grazing; makes a good hay, which stock, both horses and cattle, greatly appreciate. Paspalum, if continually grazed and not allowed to seed, has its uses in rough country, but if allowed to grow it gets very bitter and stock do not like it; it then becomes a pest. The different ryes are good, especially for grazing, and generally constitute the main bulk in meadow hay. Do not let it get too ripe before cutting. *Kikuyu* does not seed, but grows from runners. It is easily established, is a good drought-resister, yields a good supply of succulent fodder, but is not recommended for land that is likely to be tilled in the future on account of its root system.

To anyone seeking information on subterranean clover, I would refer them to Mr. Spafford's bulletin on this subject. Over 30 years ago the late Mr. A. W. Howard, of this district, wrote regarding this plant:—"We are treading under foot what we now think a weed, but which in the near future will be one of the greatest assets of the district." How truly has that prophecy been fulfilled, and what a lasting monument is this clover to the memory of the man who introduced it.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, April 26th, there being present Messrs. H. N. Wicks (Chairman), R. H. Martin, S. Shepherd, A. L. McEwin, F. Coleman, P. J. Baily, J. W. Sandford, Dr. A. E. V. Richardson, and H. C. Pritchard (Secretary).

An apology was received from Prof. A. J. Perkins.

LEAVE OF ABSENCE.—The Hon. Minister notified the Board that he had approved of leave of absence to Messrs. G. Jeffrey and J. B. Murdoch.

BUREAU EXHIBIT AT ROYAL SHOW.—The Royal Agricultural and Horticultural Society asked for particulars relating to the proposed alteration in points of the Bureau exhibit so as to provide greater scope for Branches in Hills and other similar districts. It was decided to leave the matter in the hands of Mr. F. Coleman to discuss with the Agricultural Committee of the Society.

BORDERTOWN CONFERENCE RESOLUTIONS.—1. *Varieties of Wheats Suitable to Districts:* "That a list of the varieties of wheat that have proved the most suitable and highest yielders in the various districts of the State, together with the time of seeding, be published in the *Journal of Agriculture* some time ahead of the commencement of seeding operations." The Board decided to seek a report from the Director of Agriculture on this resolution. 2. *Noxious Weeds:* "That steps should be taken to disseminate knowledge of noxious weeds through country schools and Agricultural Bureaux." The Secretary was deputed to make further inquiries into the matter

Ridley Memorial Trust.—Mr. A. M. Dawkins was nominated a member to represent the Advisory Board on the Ridley Memorial Trust.

LIFE MEMBERSHIP.—The following names were added to the roll of Life Members of the Agricultural Bureau:—Narrung Branch—Messrs. W. J. L. Thacker, E. L. Goode, J. W. McNicol, L. H. Mann, G. R. Goode. Murraytown Branch—F. J. Tregenza.

NEW BRANCH.—Approval was given to the formation of a Branch at Sutherlands, with the following persons as foundation members:—E. F. Boehm, J. Boehm, J. F. Schroeder, S. and N. Bahnisch, W., E., and A. M. Twartz, L. Niemz, H. C. Colebatch, E. R., W. G., P. R., O. B., L. G., and A. R. Schiller.

NEW MEMBERS.—The following names were added to the rolls of existing Branches:—Caliph—O. Barkhahn, B. H. Northcott; Hope Forest—G. Watson; Arthurton—H. Bishop, Ronald Brechin, R. W. Burns, A. H. Burns, Harvey Burns, S. A. Brine; Elbow Hill—Geo. Rehn; Warcowie—F. L. Williams; Warcowie Women's—Mrs. W. J. Sanders; Chilpuddie Rock—Harry Frost; Wasleys Women's—Miss Elsie Hewlett; Rendelsham Women's—Mrs. L. Foster, Miss Phyllis Foster, Mrs. E. Stratford; Hanson—Mrs. D. G. Stevens, Eric Goodridge, Jack Goodridge, Glen R. Finch.

ANNUAL CONGRESS.—The Advisory Board decided to request approval for holding the Annual Congress in Adelaide during September, and that His Excellency the Governor be requested to deliver the opening address.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on May 1st, 1933:—

BUTTER.—The demand for butter was well maintained throughout April, and owing to the shrinkage in supplies of choicest, importations from Victoria continued. Towards the end of the month, however, a break in the weather occurred and a good rain was received. This, coupled with the much cooler atmospheres ruling, enabled butter factories to manufacture a greater proportion of choicest from the cream received, and the result was that importing practically ceased. Whilst there is very little increase in actual quantities being manufactured now as compared with a few weeks back, as soon as the pastures have made a little headway, an improvement can be expected. Whilst values in the London market have shown some little improvement, as exporting has practically ceased for the time being from South Australia, this has not been reflected in local values, and rates have continued steady. Choicest creamery fresh butter in bulk, 1s. 1¼d.; prints and delivery extra. (These prices are subject to the stabilization levies.) Store and collectors, 7½d. to 8d. per lb. at store door, less usual selling charges.

EGGS.—The usual seasonal decline in quantities continued throughout the month under review, and owing to the strong Lenten and Easter demand, rates firmed. With the approach, however, of the grass season, supplies should shortly increase, and values would then have to ease back to export levels. Ordinary country eggs, hen or duck, 1s. 2d. per dozen; selected, tested, and infertile higher.

CHEESE.—Local and Western Australian buyers operated from week to week and all consignments were cleared. Supplies are now down to about lowest level, and it will be some weeks yet before any improvement can be expected. New makes, large to loaf, 6½d. to 7d.; semi-matured and matured, 9d. to 11d. per lb.

BACON.—Heavy quantities of bacon were marketed last month, as curers found it necessary to unload stocks from week to week owing to the continued heavy supplies of live hogs coming forward. Some interstate trade was negotiated, as well as heavy turnover in local trade, and therefore stocks were kept down to reasonable levels. Values are steady. Best local sides, 7½d. to 7¾d.; best factory-cured middles, 6¾d.; large, 6½d.; rolls, 6¼d.; hams, 11d. to 11½d. per lb.; cooked, 1s. Lard, prints, 4s. 6d. per dozen.

ALMONDS.—Supplies received were fairly extensive, but local purchasers operated freely, and there was no carry-over of stocks from day to day. Some growers are still holding quantities in anticipation of higher prices, although there is no suggestion of an improvement imminent. Brandis and softshells, 7½d. to 8½d.; hardshells, 4½d. per lb.; kernels, 1s. 9½d. to 1s. 10½d. per lb.

HONEY.—The demand shows some improvement with the setting-in of cooler weather, as this is a commodity which is essentially a winter food. Ample stocks were again available. Prime clear extracted in liquid condition, 2¾d. to 3¼d. per lb.; lower grades, 1½d. to 2d. per lb.

BEESWAX.—Selling freely at quotations. Stocks light; 1s. 0½d. to 1s. 1d. per lb., according to sample.

LIVE POULTRY.—As usual the markets just prior to Easter were very heavily supplied, and for some classes values drooped, although prime quality heavy weights as usual called for considerable attention and satisfactory prices ruled. Immediately after the Easter sales consignments were short of requirements, and values showed considerable hardening. We advise consigning. Crates loaned on application. Prime roosters, 3s. 6d. to 4s. 6d.; nice conditioned cockerels, 2s. 10d. to 3s. 5d.; fair conditioned cockerels, 2s. to 2s. 9d.; chickens lower. Heavy-weight hens, 2s. 8d. to 3s. 9d.; medium hens, 2s. 2d. to 2s. 7d.; light hens, 1s. 6d. to 1s. 11d.; couple of pens of weedy sorts lower. Geese, 2s. 6d. to 3s. 6d.; goslings lower. Prime young Muscovy drakes, 3s. 6d. to 4s. 6d.; young Muscovy ducks, 2s. to 2s. 6d.; ordinary ducks, 1s. to 2s.; ducklings lower. Turkeys, good to prime condition, 9d. to 1s. 1d. per lb. live weight; fair condition, 7d. to 8d. per lb. live weight; fattening sorts lower. Pigeons, 4d. each.

POTATOES.—Local new, 6s. 6d. per cwt.

ONIONS.—New season's, 5s. 6d. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of April, 1933, also the average precipitation for the month of April, and the average annual rainfall.

Station.	For April, 1933.	Av'ge for April.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.			
Oodnadatta	0·14	0·23	4·70
Marree	0·16	0·40	5·89
Farina	0·20	0·45	6·47
Copley	0·10	0·58	7·94
Beltana	0·14	0·56	8·54
Blinman	0·31	0·82	11·95
Hookina	0·08	0·70	11·53
Hawker	0·12	0·91	12·30
Wilson	0·08	0·86	11·78
Gordon	0·17	0·52	10·63
Quorn	0·18	0·92	13·29
Port Augusta	—	0·78	9·42
Bruce	0·05	0·50	9·93
Hammond	0·16	0·86	11·31
Wilmington	0·14	1·36	17·43
Willowie	0·10	0·74	12·19
Melrose	0·36	1·65	22·85
Booleroo Centre	0·28	1·16	15·15
Port Germein	0·63	1·11	12·43
Wirrabara	0·23	1·46	19·21
Appila	0·24	1·16	14·57
Cradock	0·06	0·75	10·83
Carrieton	0·16	0·79	12·31
Johnburg	0·14	0·66	10·61
Eurelia	0·12	0·84	12·87
Orroroo	0·14	0·94	13·21
Nackara	0·16	0·60	11·16
Black Rock	0·09	0·87	12·41
Oodlawirra	0·17	0·74	11·56
Peterborough	0·10	0·94	13·21
Yongala	0·23	1·05	14·42
NORTH-EAST.			
Yunta	0·09	0·58	8·50
Waukaringa	0·04	0·53	8·00
Mannahill	0·11	0·55	8·28
Cockburn	0·10	0·59	7·96
Broken Hill	0·16	0·72	9·63
LOWER NORTH.			
Port Pirie	0·56	1·18	13·17
Port Broughton	0·69	1·20	13·93
Bute	1·15	1·25	15·36
Laura	0·60	1·45	17·91
Caltowie	0·14	1·28	16·69
Jamestown	0·38	1·27	17·71
Gladstone	0·68	1·35	16·29
Crystal Brook	0·32	1·25	15·78
Georgetown	0·71	1·51	18·35
Narridy	0·26	1·28	15·85
Redhill	0·79	1·34	16·55
Spalding	0·49	1·01	18·99
Gulnare	0·86	1·05	18·56
Yacka	0·43	1·18	15·33
Koolunga	0·40	1·18	15·40
Snowtown	0·58	1·28	15·64
LOWER NORTH.—*continued.*			
Brinkworth	0·70	0·90	15·74
Blyth	0·97	1·34	16·77
Clare	0·77	1·96	24·53
Mintaro	0·81	1·55	23·42
Watervale	0·78	2·24	26·91
Auburn	1·11	1·82	23·98
Hoyleton	0·93	1·46	17·32
Balaklava	1·07	1·39	15·49
Pt. Wakefield	0·98	1·12	12·93
Terowie	0·34	0·91	13·35
Yarcowie	0·27	0·96	13·57
Hallett	0·22	1·15	16·40
Mount Bryan	0·30	0·96	16·65
Kooringa	0·28	1·22	17·89
Farrell's Flat	0·59	1·42	18·65
WEST OF MURRAY RANGE.			
Manoora	0·88	1·33	18·83
Saddleworth	1·05	1·63	19·55
Marrabel	0·86	1·60	19·84
Riverton	1·70	1·71	20·75
Tarlee	0·99	1·49	18·11
Stockport	0·83	1·31	16·88
Hamley Bridge	0·70	1·35	16·54
Kapunda	0·86	1·56	19·79
Freeling	0·79	1·39	17·85
Greenock	1·04	1·62	21·56
Truro	1·11	1·50	19·96
Stockwell	1·13	1·56	20·12
Nuriootpa	1·19	1·56	20·64
Angaston	1·21	1·67	22·43
Tanunda	0·94	1·71	22·02
Lyndoch	1·07	1·68	23·45
Williamstown	1·06	2·06	27·71
ADELAIDE PLAINS			
Owen	1·26	1·15	14·33
Mallala	1·05	1·34	16·56
Roseworthy	1·17	1·39	17·34
Gawler	1·16	1·56	18·96
Two Wells	1·41	1·33	15·70
Virginia	1·37	1·35	17·12
Smithfield	1·60	1·08	17·50
Salisbury	1·50	1·55	18·54
Adelaide	1·98	1·73	21·10
Glen Osmond	1·95	2·03	25·96
Magill	2·28	1·95	25·50
MOUNT LOFTY RANGES.			
Teatree Gully	1·88	1·90	27·30
Stirling West	3·36	3·57	46·91
Uraidla	2·89	3·21	43·91
Clarendon	2·10	2·73	32·82
Morphett Vale	1·14	1·83	22·64
Noarlunga	1·30	1·64	20·34
Willunga	1·35	1·93	26·01
Aldinga	0·75	1·47	20·21

RAINFALL—*continued.*

Station.	For April, 1933.	Av'ge for April.	Av'ge Annual Rainfall.
MOUNT LOFTY RANGES—*contd.*			
Myponga	0·87	1·70	29·48
Normanville	0·71	1·62	20·69
Yankalilla	0·74	1·62	22·85
Mount Pleasant	1·74	1·98	27·18
Birdwood	2·26	2·04	29·15
Gumeracha	2·79	2·43	33·39
Millbrook Res.	1·95	1·70	34·86
Tweedvale	3·05	2·52	35·89
Woodside	2·78	2·16	32·25
Ambleside	2·91	2·42	34·87
Nairne	2·67	2·04	28·09
Mount Barker	3·61	2·26	31·79
Echunga	2·80	2·50	33·15
Macclesfield	2·62	2·24	30·43
Meadows	2·43	2·76	36·12
Strathalbyn	1·90	1·36	19·34
MURRAY FLATS AND VALLEY.			
Meningie	0·67	1·45	18·37
Milang	0·77	1·22	14·92
Langhorne's Ck.	1·06	1·11	14·76
Wellington	0·97	1·17	14·56
Tailem Bend	0·69	0·76	14·70
Murray Bridge	0·34	1·10	13·59
Callington	1·38	1·08	15·20
Mannum	0·25	1·00	11·47
Palmer	1·08	0·86	15·43
Sedan	0·48	0·87	12·11
Swan Reach	0·10	0·53	10·60
Blanchetown	0·03	1·03	11·04
Eudunda	0·68	1·33	17·11
Sutherlands	0·19	0·62	10·82
Morgan	0·04	0·62	9·20
Waikerie	0·14	0·54	9·66
Overland Crnr.	—	0·77	10·41
Loxton	0·15	0·49	11·59
Renmark	0·20	0·65	10·49
WEST OF SPENCER'S GULF.			
Eucla	0·97	1·04	9·98
Nullarbor	0·70	0·63	8·73
Fowler's Bay	1·06	0·85	11·82
Penong	1·38	0·80	12·12
Koonibba	0·55	0·66	11·82
Denial Bay	0·51	0·90	11·36
Ceduna	0·71	0·56	9·95
Smoky Bay	0·62	0·58	10·28
Wirrulla	0·50	0·54	10·08
Streaky Bay	0·72	0·97	14·82
Chandada	0·58	—	—
Minnipa	0·68	0·60	13·68
Kyancutta	0·57	—	—
Talia	0·55	0·60	14·63
Port Elliston	0·73	1·04	16·39
Yeelanna	0·79	0·75	15·72
Cummins	0·76	0·75	17·35
Port Lincoln	0·77	1·42	19·34
Tumby	0·71	0·86	13·92
Ungarra	0·68	0·77	16·73
Carrow	0·23	0·72	13·08
Arno Bay	0·55	0·94	12·44
WEST OF SPENCER'S GULF—*contd.*			
Rudall	0·56	0·90	12·19
Cleve	0·44	1·15	14·66
Cowell	0·32	1·13	11·10
Miltalie	0·57	1·16	13·54
Darke's Peak	0·45	0·79	14·92
Kimba	0·55	0·80	11·52
YORKE PENINSULA.			
Wallaroo	1·05	1·26	13·91
Kadina	0·72	1·45	15·61
Moonta	0·91	1·45	15·05
Paskeville	1·10	1·24	15·46
Maitland	0·80	1·71	19·90
Ardrossan	1·05	1·16	13·93
Port Victoria	0·66	1·31	15·40
Curramulka	0·76	1·28	17·87
Minlaton	0·56	1·39	17·80
Port Vincent	0·50	0·88	14·40
Brentwood	0·43	1·09	15·45
Stansbury	0·46	1·27	16·81
Warooka	0·62	1·32	17·51
Yorketown	0·47	1·30	16·94
Edithburgh	0·55	1·35	16·34
SOUTH AND SOUTH-EAST.			
Cape Borda	1·32	1·86	24·83
Kingscote	0·53	1·40	19·11
Penneshaw	0·25	1·26	18·85
Victor Harbor	0·84	1·61	21·27
Port Elliot	0·80	1·54	19·91
Goolwa	0·72	1·35	17·81
Copeville	0·16	0·48	11·44
Meribah	0·23	0·99	11·10
Alawoona	0·58	0·63	10·02
Mindarie	0·28	0·56	11·91
Sandalwood	0·23	0·51	13·57
Karoonda	0·58	0·66	14·33
Pinnaroo	0·56	0·79	14·54
Parilla	0·44	0·80	13·90
Lameroo	0·54	1·03	16·08
Parrakie	0·90	0·69	14·49
Geranium	0·94	0·94	16·41
Peake	0·66	0·82	16·03
Cooke's Plains	0·73	1·11	15·38
Coomandook	0·83	1·00	17·11
Coonalpyn	1·43	1·35	17·42
Tintinara	1·38	1·30	18·60
Keith	1·47	1·10	17·87
Bordertown	1·26	1·56	19·22
Wolseley	1·26	1·53	18·41
Frances	1·48	1·42	19·99
Naracoorte	2·00	1·73	22·59
Penola	1·90	1·85	26·06
Lucindale	1·60	1·77	23·16
Kingston	0·75	1·82	24·33
Robe	0·82	1·75	24·64
Beachport	1·06	1·91	26·93
Millicent	2·10	2·32	29·76
Kalangadoo	1·82	2·05	32·03
Mount Gambier	1·83	2·33	30.52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		May.	June.
Adelaide	†	—	—
Allandale East	†	5	2
Appila-Yarrowie	*	5	2
Ashbourne	*	3	7
Auburn Women's	1213	26	R
Balaklava	*	22	26
Balumbah	†	—	—
Balumbah Women's	†	3	7
Beetaloo Valley	*	4	5
Belalie Women's	†	9	13
Berri	*	10	7
Belvidere	1234	—	—
Blackheath	†	11	8
Black Springs	†	—	—
Blackwood	*	8	12
Blyth	1225	26	23
Booleroo Centre	*	5	2
Boolgun	†	—	—
Boor's Plains	*	4	1
Bowhill	*	8	5
Brentwood	†	4	1
Brinkley	*	10	7
Brinkworth	*	8	5
Brownlow	1228	—	—
Buchanan	1229	—	—
Bugle	*	9	13
Bute	*	18	15
Caliph	*	2	6
Caralue	*	3	7
Carrow	*	10	7
Cherry Gardens	†	6	3
Chilpuddie Rock	†	—	—
Clare Women's	1214	—	—
Clarendon	*	8	5
Cleve	*	6	3
Collie	*	3	7
Coomandook	†	26	30
Coonawarra	*	11	8
Coonawarra Women's	†	17	21
Cummins	*	12	9
Cungena	*	4	1
Currency Creek	*	8	5
Elbow Hill	†	4	8
Eudunda	*	1	5
Eurelia	*	13	10
Eurelia Women's	*	3	7
Everard East	1226	—	—
Farrell's Flat	*	26	30
Frances	*	3	7
Frayville	†	—	—
Georgetown	*	6	3
Geranium	*	27	24
Gladstone	*	5	2
Gladstone Women's	†	12	9
Glencoe	*	9	13
Goode	†	10	7
Goode Women's	*	10	7
Greenock	*	15	12
Green Patch	1231	4	8
Gumeracha	*	8	5
Hanson	*	9	6
Hartley	†	10	7
Hindmarsh Island	†	—	—
Hope Forest	†	1	5
Hoyleton	*	15	19
Inman Valley	1235	18	15
Jamestown	†	17	21
Jervois	*	11	8
Kalangadoo Women's	*	13	10
Kalangadoo	*	13	10
Kalyan	*	17	21
Kangarilla Women's	*	18	15
Kapinnie	†	—	—
Kapunda	*	12	9
Karoonda	*	10	7
Keith	*	4	8
Kelly	1231	6	3
Kilkerran	†	9	R
Kongorong	*	8	5
Koonibba	*	4	1
Koppio	*	9	6
Kringin	*	8	5
Kulkawirra	†	9	13
Kyancutta	†	2	6
Kybybolite	*	4	8
Kybybolite Women's	*	9	6
Lameroo	*	6	3
Langhorne's Creek	†	3	7
Laura	*	13	10
Laura Bay	†	9	13
Lipson	*	6	3
Lone Gum and Monash	*	10	7
Lone Pine	*	8	5
Lowbank	*	10	7
Loxton	*	12	9
Lyndoch	†	9	6
McLaren Flat	†	—	—
McLaren Flat Women's	†	4	1
Macclesfield	†	18	15
MacGillivray	*	9	6
Mallala	1231	15	19
Maltee	†	4	8
Mangalo Women's	†	—	—
Meadows	*	3	7
Meribah	*	8	12
Milang	†	6	R
Millicent	*	26	30
Millicent Women's	*	—	—

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Branch.	Report on Page.	Dates of Meetings.	
		May.	June.
Miltalie	†	6	3
Mindarie	*	5	2
Monarto South	1232	—	—
Moorlands	*	—	7
Morchard	†	5	2
Mount Barker	*	15	19
Mount Compass	*	4	1
Mount Gambier	1223	12	9
Mount Hope	1231	9	6
Mudamuckla	†	13	10
Mundalla	†	—	—
Mundalla Women's	1216	11	8
Murraytown	1226	—	—
Myponga	*	18	15
Myrla	*	10	7
Nantawarra	1228	4	8
Naracoorte	*	13	10
Nelshaby	*	—	—
Netherton	*	10	7
Nunjikompita	*	4	8
Nunkeri	*	3	7
O'Loughlin	*	8	12
Overland Corner	1234	10	7
Owen	*	5	2
Parilla	†	2 & 30	27
Parilla Women's	*	17	21
Parilla Well	*	16	20
Parilla Well Women's	*	16	20
Parrakie Women's	*	30	27
Paruna	*	5	2
Paskeville	*	9	6
Pata	*	5	2
Penola	†	6	3
Penola Women's	†	—	—
Penwortham	*	4	8
Petersville	*	9	6
Petina	*	27	24
Pinnaroo Women's	*	5	2
Port Elliot	†	20	17
Pygery	1216	9	6
Ramco	*	8	5
Redhill	†	9	6
Rendelsham	1216	6	3
Rendelsham Women's	*	—	—
Riverton	†	8	12
Rudall	*	9	6
Saddleworth	*	12	10
Saddleworth Women's	1216	2	6
Scott's Bottom	*	6	3
Shoal Bay	†	9	6

Branch.	Report on Page.	Dates of Meetings.	
		May.	June.
Snowtown	*	12	10
South Kilkerran	†	9	6
Springton	†	3	7
Stanley Flat	*	15	19
Stockport	*	—	—
Strathalbyn	*	10	14
Streaky Bay	*	26	23
Tailem Bend	*	11	15
Talia	*	26	30
Tantanoola	*	6	3
Tantanoola Women's	*	3	7
Taplan	*	9	6
Taragoro	1232	4	8
Tarlee	*	R	R
Truro	1228	15	19
Tulkineara	*	11	8
Tweedvale	*	18	15
Ungarra	*	11	15
Upper Wakefield	†	4	8
Uraidla and Summertown	*	1	5
Waddikee Rocks	*	8	3
Waikerie	*	12	9
Wallala	†	10	14
Wanbi	*	24	28
Wandearah	*	9	6
Warcowie	1224	9	6
Warcowie Women's	1217	9	6
Warramboo	*	9	6
Warramboo Women's	1218	—	—
Wasleys	†	11	8
Wasley's Women's	1218	4	1
Watervale	†	15	19
Wauraltee	*	9	6
Weavers	*	8	12
Wepowie	1224	8	5
Williamstown Women's	1220	3	7
Willowie	*	22	26
Wilmington	†	9	13
Wirrabara	*	—	—
Wirrilla	*	6	3
Wirrilla Women's	*	4	1
Wirrulla	*	17	21
Wolseley	1222	8	12
Wudinna	†	—	—
Yadnarie	†	9	6
Yandiah	*	12	9
Yeelanna	*	10	7
Yurgo	†	—	—
Yurgo Women's	†	—	—

* No reports received during the month of April.

† Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA.

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[Branch Secretaries are reminded that the following are exempt from payment of the Annual Bureau subscription:—Life members, Branch Secretaries, members appointed before August 1st, 1930, and new members who reside in the same house as (a) a life member, (b) Secretary, or (c) another member who already subscribes.

The subscription for all other members is 2s. 6d., commencing from August 1st in each year, provided that—subject to the above exemptions—nominations forwarded during the months of January to June must be accompanied by a payment of 1s. 6d. each nomination for that period.]

WOMEN'S BRANCHES.

AUBURN (Average annual rainfall, 24.00in.).

March 31.—Present: 21 members.

Breakfast Dishes.—Mrs. Garrett read the following paper:—"The majority of husbands of wives of members of a Women's Branch of the Agricultural Bureau are farmers, or whose folk must rise with the break of day, and it is intended to deal with a menu, not to tempt the palate but to satisfy the appetite for breakfast. In the first place simplicity must be the keynote of every breakfast, for time will not permit of great preparation. Moreover, the careful housewife will always consider the cost of the meal produced. The morning meal should start with something hot and easily digested, and for this there is nothing better, cheaper, or more nourishing than a well-prepared and carefully-cooked cereal. Any of the breakfast preparations are excellent, but are no better than oatmeal, which can be purchased cheaply. Although more heating for those whom it suits, clean, well crushed wheaten grain, put twice through an ordinary corn-crusher, makes a palatable breakfast dish. Soak the required amount of cereal overnight to render it soft and more easily cooked. A chop or bacon carefully prepared is much appreciated on winter mornings, needing but little time to cook; but for summer, meat at the first meal of the day should be served cold—most folk will agree that one nutritious hot meal a day is sufficient in summer. The egg is pre-eminently a breakfast dish, boiled, poached, or scrambled with toast, or Scotch toast, fried with bacon or chop. The great variety of ways in which eggs can be served renders them a breakfast delight. Country women, and particularly those who live on farms, can provide savory and economical dishes. Meat is very cheap, eggs the greater portion of the year are worth not more than 6d. per dozen, and crushed wheat ½d. per lb. The teaching of dietetic experts should be followed by not overcooking meals, particularly the first meal of the day. This diminishes the real food content, and by careful planning one can avoid the serving of recooked or hashed dishes."

Recipes.—*Viennese Tomatoes*—These make a very nice breakfast dish, and the meat can be cooked overnight. 1lb. medium-sized tomatoes, ½lb. of sausages, a little parsley, a round of buttered toast for each tomato. Method: Cut the tomatoes round in halves. Skin the sausages and divide the meat into as many even-sized portions as there are tomatoes. Shape these pieces into flat round cakes to fit the tomatoes, fry these slowly until brown on each side and cooked through. Use a small piece of dripping to start the frying; when fried lay each sausage cake on half a cut tomato, put a second half tomato on top of the sausage, place tomatoes on a baking dish, bake until tomatoes are hot and tender but not broken; put a tomato on each round of toast, sprinkle with parsley, and serve hot. ***Buttered Eggs with Grated Beef***—3 eggs, 3 tablespoonfuls milk, 3 pieces of buttered toast, 1oz. butter, 3 tablespoonfuls grated cold corned beef, seasoning. First prepare the toast, butter it and keep hot, grate the beef on a breadgrater, beat the eggs until slightly frothy, mix them with the milk, add salt and pepper to taste; melt the butter in a saucepan and when bubbling pour in the egg mixture and stir over a gentle fire. Heat until it becomes a creamy mass; if over-heated it is spoilt. When cooked, pile neatly on the toast and sprinkle on the surface of each a layer of beef. Serve as hot as possible; tongue can be used instead of beef." (Secretary, Miss L. Dennison.)

CLARE (Average annual rainfall, 24.54in.).

March 14th.—Present: 20 members, eight visitors.

Biscuit Making.—Miss Lee contributed the following paper:—"Parties or picnics arranged on the spur of the moment do not require so much cooking if there is a supply of biscuits on the pantry shelf. It is worth putting aside a morning for a 'biscuit bake.' Home-made biscuits are always enjoyed, and many varieties can be made from the same mixture by using different cutters, icings, and decorations. Those that can be made by dropping from the tip of a spoon are less troublesome. When a mixture has to be rolled it should be cold and firm. If possible, put in a cool place until it is firm, and only use portion of the dough at a time. The rolling should be done evenly, so that the biscuits are of uniform thickness. They will then brown evenly and take the same time for baking. It is not wise to add flour to a biscuit paste that has become soft. This will cause the biscuits to become hard and dry; it is better to put the paste away in a cool place until it becomes firm. Always dip the cutter in flour before using it, and place all biscuits on cold oven trays, only greasing them when fat is less than half of the flour. When the biscuits are cold, store each variety in separate airtight jars or tins. Biscuits should be baked in a moderately hot oven, with the exception of those made with treacle, such as ginger nuts, which require a slow oven—the treacle causes them to burn if the oven is too hot. The following are some easy and for the most part economical recipes:—*Nutties.*—Three cups flaked oats, 1 cup each desiccated cocoanut, butter, and sugar, 1½ cups flour, 4 tablespoonfuls treacle, 1 teaspoonful carbonate soda. Method: Melt butter and treacle, dissolve soda in 2 tablespoonfuls boiling water; mix all ingredients, and drop small teaspoonfuls on greased slides and bake in a very slow oven. *Eggless or Foam Biscuits*—1lb. flour, ¼lb. butter, 1 cup sugar, ½ cup milk, 1 teaspoonful soda. Boil sugar and milk, add soda, stir and allow to cool. Rub butter into flour, mix with cold boiled mixture, roll thin, cut into required shapes, and bake in moderately hot oven a delicate brown. Put filling between and ice tops or leave plain as desired. *Bachelor's Buttons*—5oz. flour, 3oz. sugar, 3oz. butter, 1 egg, a very little baking powder, and a pinch of salt. Mix butter and sugar together, add beaten egg, stir in flour. Roll into small balls, dip in sugar, and bake. *Almond Fingers*—½lb. flour, ¼lb. butter, 2oz. sugar, 1 egg, 1 teaspoonful baking powder, essence of lemon, salt, almonds finely chopped. Rub butter into flour, add sugar, mix into a stiff dough with yolk of egg and very little water. Roll out, spread with stiffly-beaten white of egg, cover with chapped almonds, sprinkle with a little sugar, cut into fingers, and bake in slow oven. *Spice Biscuits*—1 cup butter, 2 cups flour, ½ cup milk, 1 teasponful cream tartar, ½ teaspoonful soda, 1 cup sugar, 1 teaspoonful each of cinnamon and nutmeg, 2 teaspoonfuls of spice. Sift dry ingredients together, rub in butter, mix with milk, roll out, cut, and bake in moderately hot oven. When cold put filling or jam between and ice top. *Cocoanut Biscuits*—10oz. flour, 5oz. sugar, 5oz. butter, 2 eggs, 1 small cup desiccated cocoanut, 1 teaspoonful baking powder, pinch of salt. Beat butter and sugar to a cream, add eggs, sift in flour together with powder and salt, drop in small pieces on cold oven trays and bake."

Biscuit Recipes.—The following were given by Mrs. F. Pink:—*Ginger Slices*—1 egg, 1 cup S.R. flour, 2ozs. butter, 1 tablespoonful ginger, 2 large tablespoons icing sugar, a little water, 2ozs. blanched and chopped almonds. Rub butter into flour, add ginger, mix with well-beaten egg and little water to smooth firm dough, spread over slightly beaten white of egg, and mix with icing sugar. Strew over chopped nuts, bake in quick oven for 10 minutes. *Cocoanut Biscuits*—½lb. fine oatmeal, ½lb. plain flour, ½ teaspoonful carbonate soda, 1 teaspoonful cream tartar, pinch salt, 1 cup cocoanut, 1 egg, a little milk, 6oz. butter, juice ½ lemon, 1 cup sugar. Put all dry ingredients into basin, rub in fritter, add well-beaten egg, add milk, put juice lemon in egg. Put in small pieces on slide, cook in moderate oven until nice color. *Thin Captain Biscuits*—2 cups S.R. flour, 2 large tablespoonfuls butter, salt. Mix to a stiff dough with warm water, roll very thin, cut out, prick with a fork, put on a hot greased slide; bake in a hot oven. *Cheese Straws*—¼lb. grated cheese, 6oz. S.R. flour, 2oz. butter, 1 egg, cayenne to taste, salt and pepper. Mix cheese, flour, salt, and pepper together. Rub in butter, add egg well beaten, a little milk if too stiff. Roll out thin, cut into strips about ½in. wide and 2½in. long. Bake in a very moderate oven until a light brown. *Rice Bubble Macaroons*—2 whites of egg, 1 cup sugar, essence vanilla, 1 cup cocoanut, 2 cups rice bubbles, ½ cup chopped nuts. Beat egg whites stiff, add sugar gradually, then essence, cocoanut, rice bubbles, and nuts. Drop by spoonfuls on greased slide, bake in a moderate oven until delicate brown. *Ginger Nuts*—2½ cups flour, 1 cup sugar, ¼lb. butter, 1 cup treacle, 1 tablespoonful ginger, 1 egg, 1 teaspoonful carbonate soda, 1 tablespoonful boiling water. Put flour, half the sugar and ginger into a basin, rub butter into flour, beat egg with rest of sugar, melt treacle, and add carbonate soda with boiling water. Put in small pieces on a cold slide. Butter hands and roll into balls. Cook 15 minutes in a moderate oven. *Chocolate Biscuits*—¼lb. butter, 3oz. sugar, 6oz. S.R. flour, 1 egg, 2oz. dark cocoa, essence vanilla. Beat butter and sugar to cream, add egg, and beat well. Add flour and cocoa mixed. Roll out thin, put on a cold tray, and cook for 10 minutes in a fairly hot oven. *Coffee Kisses*—4oz. butter, ½lb. S.R. flour, 3oz. sugar, 1 egg, 1 tablespoonful coffee essence, pinch salt. Beat butter and sugar to cream, add coffee essence, sift flour and salt, beat egg well, add flour and egg alternately. If too stiff add 1 tablespoonful of milk. Place 1 teaspoonful of mixture at a time—not too close—on a well-greased oven-slide. Bake in a hot oven for 10 minutes. When cool join two together with coffee icing made with 3 tablespoonfuls icing sugar, 1 tablespoonful melted butter, 1 teaspoonful coffee essence. *Federal Biscuits*—½lb. butter, 1lb. S.R. flour, ½lb. sugar, 2 eggs, 1 tablespoonful milk. Beat butter and sugar to cream, add eggs well beaten with milk. Add alternately with flour, roll out, cut into shapes or put through biscuit forcer. Bake in a moderate oven. *Cinnamon Wheels*—3 cups S.R. flour, 1 cup sugar, ¼lb. butter, 2 eggs, ½ cup milk. Rub butter into flour and sugar, beat egg, mix with milk, and make into nice dough. Roll into long strips, spread lightly with jam or cinnamon and sugar mixed. Cut into slices, place cut side down on greased slide. Bake in a moderate oven. *Cream Biscuits*—Take 1 cup sweet cream, 1 cup sugar, 2½ cups flour, essence, 3 teaspoonfuls baking powder, pinch salt. Beat sugar and cream well, add other ingredients, roll out and cut into shapes. Bake in a moderate oven. If liked, whip white of egg stiffly with 2 teaspoonfuls sugar; spread a little jam on first, then egg white, put into oven to slightly brown. *Iced Currant Fingers*—¼lb. butter, ½lb. flour, 2oz. currants, 2 eggs, 3oz. sugar, 1 teaspoonful cream tartar, ½ teaspoonful carbonate soda, a little milk if needed. Rub butter into flour and sugar, add well-beaten eggs, keep out white to whip with 1 tablespoonful sugar to spread on top; add currants after rubbing butter into flour. 100 *Biscuits for 6d.*—1lb. flour, ½ cup butter or dripping, ½ cup milk, 1 small cup sugar, 1 teaspoonful car-

1933 CALENDAR 1933

JANUARY

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1934 CALENDAR 1934

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bonate soda. Place milk and sugar in saucepan on stove and bring to boil. Take off and cool, then add 1 teaspoonful carbonate soda and stir well. Rub dripping into flour, make hole in centre, pour warm mixture in, work into stiff dough, roll out thin, and cut into shapes. Bake in a quick oven. The mixture can be rolled out into one long strip, raisins or jam spread on one half, then fold the other half over, roll out, and cut into fingers. (Secretary, Mrs. A. Rogers.)

MUNDALLA (Average annual rainfall, 19.32in.).

March 9th.—Present: nine members.

Mrs. P. Fisher supplied a book of recipes of jam and fruit bottling. The secretary gave a recipe of quince and tomato jam:—Peel and core 2lb. quinces and put them through the mincer; pour boiling water over 3lb. of ripe tomatoes and remove skins; put quinces and tomatoes into a preserving-pan with 5lb. of sugar, and boil 2½-3 hours. Pot in the usual way. *Question Box.*—Which is the best plum for sauce-making?—Ans.: Satsuma blood plum. Which is the best grape for jam?—Ans.: Black Prince. The easiest way to clean a Panama hat?—Ans.: Rub block magnesia well over hat, then wrap in bath-towel and leave three or four days. Hat should then be quite clean. What is the correct time to plant loganberries in this district?—Ans.: June. How to remove hair oil from a man's felt hat?—Ans.: Failing eucalyptus or cloudy ammonia, do hat all over with benzine. (Secretary, Miss K. Hillier.)

PYGERY.

December 16th.—Present: 16 members.

Miss I. Heylen read an instructive paper, "Tomato Culture."

Household Hints.—The following were given by Mrs. R. Woodrup at a meeting held on January 13th:—Lemons yield their juice more freely if put in the oven five minutes before using. A lemon drink with a pinch of bi-carbonate of soda will relieve a sick headache. Add half a lemon to stewed prunes, and it will improve the flavor. Sprinkle Epsom salts where clothes are stored in boxes and it will prevent damage by moths and silverfish. Borax is very good for sore mouth and as a gargle. To keep dripping, put 1 tablespoon of borax to 2 pints of hot water; take out the fat when set. Where ants are bad, sprinkle a mixture of borax and sugar. When making pickles, add a small lump of alum, it will make the vegetables crisp. Apricot jam syrup thinned with water makes a glaze for pastry after taken out of the oven. To clean white tennis shoes, mix 1 dessertspoon of whitening, 1 teaspoon boiled starch, with enough water to make a smooth paste. Two ounces beeswax and 1 pint turpentine makes a good floor polish. Olive oil and vinegar, equal parts, is a good furniture polish. For stains on aluminium, use a little lemon juice; never use washing soda. Sprinkle mushrooms with salt for a few minutes; those which turn black are wholesome, those that turn yellow are non-edible. When scraping new potatoes, add salt. The skins come off more easily and the hands will not be stained. For a night light, pack salt around the neck of a candle and it will give a dim light. To clean a white straw or Panama hat, use hydrogen peroxide diluted with an equal quantity of water. Wet only a small space at a time, and dry with a clean cloth. (Secretary, Miss J. Heylen.)

RENDELSHAM.

March 1st.—Present: 12 members.

Soap Making.—Mrs. O'Toole gave the following recipes:—*Ingredients.*—6lbs. clarified fat, 2galls. water, 1 tin caustic soda, ¼lb. resin, 6ozs. borax, 1 packet lux, 1 cup kerosene. Place fat, water, and resin in a copper, when dissolved add caustic which has been dissolved in cold water, add borax, bring to a boil, and add lux. Do not over stir. Boil until it strings when dropped from a stick—which does not usually take long. Take from fire and add kerosene. A tablespoon of Glauber's salts added to mixture keeps soap from shrinking. Always keep a dipper of water handy—if soap rises too much, add a little. Soap mixtures easily boil over, so that it is advisable to use a copper in preference to smaller vessels, also to have a small fire once the mixture is boiling. *Sand Soap.*—Cut up 1 bar of soap in 1 quart of water, stir well until dissolved, then stir in 1 quart of clean sand and 1 quart of white wood ashes. Remove from fire and stir occasionally until set. An economical recipe for oatmeal soap. Take all scraps of soap, to each ½ teacup add 1 teacupful of water. Dissolve, and while slowly boiling stir in sufficient fine oatmeal to form stiff mixture. Pour into greased tin and cut into cakes before becoming hard. Scent may be added if desired. (Secretary, Mrs. Andrews.)

SADDLEWORTH (Average annual rainfall, 19.54in.).

April 4th.—Present: 10 members.

Growing Fruit Trees from Stones.—Paper read by Mrs. W. Ashton:—"The value of fresh fruit in a home cannot be over-estimated. For growing children its value is more than money—it is health. A tree with proper care gives so much shade, shelter, beauty, fruit, and money. Growing trees from the kernels has proved much cheaper than purchasing them from a nursery, and they also grow quicker, larger, and bear fruit at an earlier age. So far the fruit has been of excellent size and quality. I picked 20 dozen beautiful peaches from one tree grown by planting a stone. The third year one peach tree bore for the first time 13 peaches, each weighing 8ozs., and each year since has yielded more in quantity. Almond trees are very profitable. They are useful for making sweets, cakes, and biscuits, also for children to eat several after each meal helps to take care of the teeth. One tree yielded 21lb. of softshell almonds, and the other trees are growing and each year producing more nuts. An almond tree gives many things in return for a little attention—shade and shelter, the blossoms are helpful to the bees, the leaves when they fall can be gathered and put into a pit to enrich the soil, the nuts bring in money; when pruned the twigs are tied in bundles to help make the fires, and the outside skins—shells and kernel skins—are dried for fire kindling. Plant one nut in the soil, and it will return many. Mrs. Ashton gave the following recipes:—Honey Toffee—2 tablespoonfuls honey, 2 tablespoonfuls butter, 2 tablespoonfuls sugar, a little vinegar. *Almond Biscuits*—½lb. flour, 6oz. butter, 6oz. sugar, 1 egg, grated almond on top. *Almond Fudge*—1 cup sugar, 1 tablespoonful cocoa, I tablespoonful butter, 1 small cup milk, pinch of salt. Boil quickly for 10 minutes, take off fire and stir in chopped almonds and cocoanut until it thickens.

Mr. Coleman gave a demonstration of budding and grafting. (Secretary, Miss G. Frost.)

WARCOWIE (Average annual rainfall, 11.4.in.).

PICKLES, SAUCES, AND CHUTNEYS.—The following recipes were supplied by Mesdames E. and H. Jarvis:—Cut up the vegetables over night, sprinkle with salt, or make a brine of salt and water, and pour over them. Next morning drain well, and proceed with the making. *Green Tomato Pickles* (Mrs. E. Jarvis).—1 quart green tomatoes,

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with
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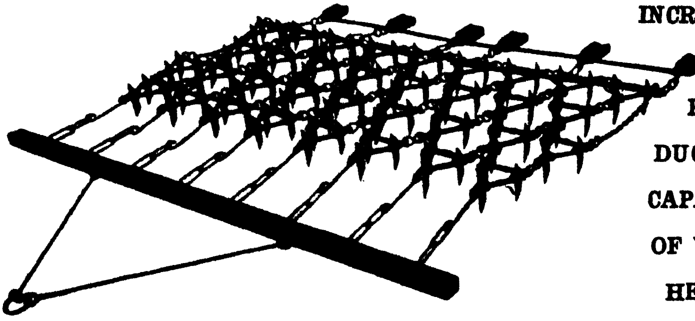

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cut in slices, and sprinkle with salt, leave for 12 hours, then strain off the liquor, and mix together 2 quarts vinegar, 1 pint treacle, 1 teaspoon each powdered cloves and salt, 2 teaspoons mustard, and a little tumeric, heat to boiling point. Put in tomatoes, a little cayenne pepper, 3 large onions, and boil 1 hour. *Plum Sauce.*—6lbs. plums, 1 quart vinegar, 1½lbs. brown sugar, 2ozs. each cloves, salt and whole ginger. Wash plums, bruise ginger and cloves, and put all ingredients on to boil. Simmer until the stones leave the plums easily, then strain and bottle. *Melon Chutney.*—8lbs. melon, 2lbs. each onions and apples, 1 teaspoon pepper, 3ozs. salt, 1 dessertspoon cloves, 1oz. each ground ginger and spice, 3 pints vinegar, ½ pint treacle, 2lbs. each sugar and currants; boil all together for 1½ hours. *Onion Pickles* (Mrs. H. Jarvis).—12lbs. onions, cover with boiling water and a large handful of salt, leave standing until next day. Strain and cover with more boiling water and salt. Boil enough vinegar to cover and add 1 teaspoon peppercorns, 1 tablespoon mustard, and 3lbs. sugar. *Tomato Chutney.*—3lbs. ripe tomatoes, 3lbs. apples, 1lb. onions, 1lb. sugar, a piece or two of garlic, 1oz. ground ginger, a few currants or sultanas and cloves. Cover with vinegar and simmer 2 hours. *Beetroot Chutney.*—3lbs. beetroot, 1½lbs. apples, 2 onions, 1 pint vinegar, ½ teaspoon ginger, 1 teaspoon salt, ½lb. sugar, and juice of a lemon. Boil beetroot for 1½ hours in water to which a little salt has been added. When cold, peel and cut in cubes. Prepare onions and apples, chopped small and boil for 20 minutes in the vinegar to which sugar and lemon juice have been added. Then add beetroot and boil for quarter of an hour. When cold bottle and seal in usual way. This will be ready in a week. (Secretary, Mrs. A. Crossman).

WARRAMBOO.

March 31st.—Present: 10 members.

Home Cleaning and Polishing.—Miss C. Sampson read the following paper:—"First go through each room, turn up the beds, push open doors and windows, and then as soon as breakfast is over and washing-up is done, the rooms are ready for attention. When dusting, it is a good plan to cover up the furniture and ornaments, etc., with an old patched sheet. A little phenyl or kerosene added to the water when washing the floors is a good disinfectant, and the kerosene also helps to keep the hands soft. Windows and mirrors can be cleaned very easily with Bon Ami rubbed on with a damp cloth, and when dry rubbed off. When polishing furniture, a good polish can be made by mixing together equal parts of olive oil and vinegar. In homes where there are small children and there is a danger of them falling on slippery floors, instead of polishing, rub the floors over with a cloth to which a little kerosene has been applied. Another suggestion is to mix 2 cups of kerosene and 1 cup of new linseed oil. Shake both together and apply to the floor with a cloth or mop. Those who have to use Tod reservoir water on washing days will no doubt find that if they put 1 or 2 tablespoonfuls of water glass in a basin, and pour on enough boiling water to dissolve it properly; tip all into the copper of water, and there will be no difficulty in making a good lather. The copper can be kept clean by rubbing it with salt and vinegar." (Secretary, Mrs. A. Collins.)

WASLEYS.

April 6th.—Present: 40 members.

Boiled Puddings (Mrs. Selleck).—These puddings are wholesome and nourishing and suitable for the winter. Suet, butter, or clarified fat may be used. Bread crumbs added to the mixture help to make the pudding light. Boiled puddings are cooked in a cloth, or in a greased basin covered with a cloth. If the latter is used the mixture must fill the basin. The water must cover the pudding and be kept boiling. Always dip the pudding cloth in boiling water and sprinkle with flour. To prevent the pudding from sticking, allow it to stand a few minutes before removing from the cloth. Pudding cloths should not be washed with soap. Boiled puddings are always best when eaten directly after taking them up, but if any is left over it can be sliced and put in the oven to heat, when it will be very nice with hot sauce. All light custards and puddings made principally with milk and eggs should be very gently cooked—a strong heat causes milk and eggs to curdle. Batter puddings should be baked in a quick oven. *Poor Man's Pudding* (Boiled).—3 cups flour, 1½ tablespoonfuls dripping, 1 cup sugar, 1 cup raisins, ½ teaspoon cinnamon, ½ teaspoon mixed spice, 1 teaspoon carbonate soda. Rub dripping into flour, then sugar and other ingredients, mix with boiling water, boil in a cloth for two hours. *Steamed Puddings.*—Steaming is the lightest method of cooking puddings. They may be cooked in two ways:—(1) In a steamer placed over a saucepan of boiling water; or (2) in a saucepan in which the water comes only half-way up the basin. Steamed puddings should be put in a greased basin and covered with greased paper. The basin should be only three-parts full. The fat used should be butter or clarified fat. Suet puddings may be steamed. They take much longer than when boiled. The water should boil quick enough and give sufficient steam. When steaming in a saucepan, be careful that no water enters the pudding. *Red Cap Pudding.*—1 tablespoonful butter, ½ cup sugar, 2 eggs, 1¾ cups flour, 1 teaspoonful cream tartar, ½ teaspoonful carbonate soda, 3 tablespoonfuls jam (a red tart jam). Mix butter and sugar to a cream, add eggs, milk, and flour. Put jam in the bottom of steamer, then add the mixture. Steam two hours. Serve with sauce.

CAKE FILLINGS: (Miss I. Sires).—*Walnut Filling*—2 tablespoonfuls icing sugar, 2 tablespoonfuls whipped cream, 1oz. walnuts, squeeze of lemon juice, 4 tablespoonfuls apricot jam. Warm and sieve the jam, work in the icing sugar, whip cream, and fold into other ingredients. Lastly add walnuts and lemon juice. *Cocoanut Filling.*—¼pt. milk, 3 tablespoonfuls cocoanut, sugar to taste, ¼ teaspoonful cornflour, 1 egg. Boil together and spread between layers. *Date Filling.*—Stone dates and stew them with a little water and juice of ½ a lemon and spread on cake. *Chocolate Filling.*—Boil ½ cup sugar, ½ cup water, a small piece of butter, 1 tablespoonful cocoa, 1 teaspoonful vanilla. Thicken with a dessertspoonful cornflour mixed with the juice of ½ a lemon. *Sponge Filling.*—2 tablespoonfuls each butter, ordinary sugar, and boiling water, beat for 10 minutes or more until solid like whipped cream, place between cake as soon as made. *Banana Filling.*—A nice filling is made from banana and a little raspberry jam mashed well together. When ready to serve sponge, place sliced bananas that have been soaked in orange juice on one layer, sprinkle with sugar, then put other layer on top and ice. *Fruit Fillings.*—*Orange*: Melt 1oz. butter, add 4oz. castor sugar, grated rind of 1 orange, and yolks of 2 eggs. Stir over a low heat until mixture thickens, but do not let it boil. Add 1oz. cake crumbs, juice of 1 orange, and teaspoonful lemon juice. Use when cold. *Lemon Filling* is made in the same way, using 2 lemons in place of orange. Bottled or tinned apricots, peaches, or pineapple, drained from their syrup, make pleasant fillings. Put a layer of whipped cream on half the cake, put a layer of fruit cut into dice, place other half of cake on top.

SANDWICHES AND SAVORIES (Miss G. Smith).—These sandwiches should be of assistance to mothers who have to cut lunches, and to ladies wanting to make something special for afternoon tea or a bridge evening. A good plan when cutting fresh bread is to dip the knife in hot water, wipe it, and cut the bread with the hot knife. This may have to be done for each slice. When spreading hard butter, instead of melting it, use a hot knife, or use butter freshly made or that which has been worked down with the hand. *Recipes.*—(1) Measure equal quantities of raisins, currants, and sultanas. Mix well, and put through mincer, add a squeeze of lemon, and spread between thin slices and bread and butter. (2) To one cup of seeded raisins or sultanas add 4oz. to 6oz. of ham (minced), 2 or 3 tablespoonfuls cucumber pickle, and salt and pepper to taste. Stir in sufficient cream or mayonnaise to bind, and spread easily; serve between slices of brown bread. (3) *Salmon and Lettuce.*—Remove bone from some salmon and break up with a fork. Shred some lettuce, mix together with a squeeze of lemon and pepper and salt. Spread on bread and butter. (4) *Cheese and Nut.*—Grate some cheese. Blanche and chop walnuts or almonds. Mix together, adding a little salt and pepper. Add a little cream, enough to make a paste. Spread on buttered bread. (5) *Anchovy.*—Grate 2 hard boiled eggs and mix with a little anchovy essence and lemon juice, season with pepper. (6) *Apple and Celery.*—Peel and core an apple, cut into dice. Shred some celery finely, and mix together, apple, celery, pepper, salt, and a little cream. (7) *Cheese and Egg.*—Mash some hard boiled egg and season with pepper and salt and mustard, enough Worcester sauce to make a paste. Spread some thinly sliced bread with butter and Rex cheese, then the egg mixture. Spread nasturtium leaves on, and then place bread on top to form a sandwich. *Savories.*—(1) *Fried Chicken.*—Steam breast of chicken until tender, then dip in batter and fry, serve on a mound of perfectly cooked rice with chicken gravy. (2) *Ham and Potato Hotpot.*—1½lb. cooked ham, 1lb. cooked potatoes, tomatoes or brown gravy seasoning. Remove bone, and cut ham into dice, put into casserole with seasoning, Then pour sauce over, cover with thinly sliced potatoes, put lid on, and bake slowly. (3) *Mutton and Tomatoes.*—½lb. cold mutton, 2 shallots, 3 tomatoes, ½ teaspoonful salt, ½ teaspoonful pepper, 2 tablespoonfuls bread crumbs, and 1 dessertspoonful butter. Dip tomatoes in boiling water, skin, and slice on a plate. Slice meat thinly, chop shallots finely. Put the meat, shallots, tomatoes, pepper, and salt in alternate layers in piedish. Sprinkle crumbs on top with a few pieces of butter. Bake until a pale golden brown. (4) *Curry and Rice.*—½lb. cooked meat, 1 apple, ½ teaspoonful salt, 1 onion, 1 dessertspoonful sultanas, 1 teaspoonful lemon juice, 1 teaspoonful sugar, 1 dessertspoonful curry powder, ½pt. stock or water, 1 dessertspoonful flour, ¼lb. boiled rice. Cut meat into small pieces, removing fat and gristle. Cut apple and onion into dice, melt fat in a saucepan, fry apple and onion, add rest of ingredients except meat and rice, and fry for a few minutes. Add water or stock and stir until it boils. Allow to simmer gently for 25 minutes. Add meat, and cook until thoroughly heated (about 10 minutes). (5) *Savory Potatoes.*—½lb. mashed potatoes, 1oz. cheese, 1 teaspoonful marmite dissolved in 1 or 2 tablespoonfuls boiling water, and season as required. Grease piedish well. Mix potatoes, cheese, and marmite seasoning. Put into piedish with melted butter on top, and bake until nicely browned. (Miss George, Secretary.)

WILLIAMSTOWN (Average annual rainfall, 27.71in.).

March 1st.—Present: Nine members.

APPLES AND WHAT TO DO WITH THEM.—The following paper was read by Mrs. Coleman:—"As a food, apples possess valuable properties, their medicinal value cannot be over-estimated, and as a general rule they are so cheap as to be within the reach of all households. Children to whom fruit is especially necessary become very tired of baked and stewed apples, but if they are presented in new and attractive forms they will be readily consumed and appreciated. The white of an egg whipped to a stiff froth, sweetened and placed on stewed apples, or spread over the baked ones and served as a "frosting" will appeal to the children at all times. Again, if the apples are supplied with stuffings of raisins, dates, or apricot jam these all make for variety and will ensure a speedy disappearance of such-like preparations. The following recipes and suggestions are a few of the many ways in which apples may be served, and will be found useful and help to solve the problem of the eternal apple-pudding question. *Apple Meringue*: 1lb. apples, 2ozs. sugar, 1oz. butter, 2ozs. bread or cake crumbs, 2 eggs, rind of half a lemon. Peel and core apples, cut them up and stew until pulpy. Add the sugar, grated lemon rind, crumbs, and butter, and also the yolks of the eggs. Place this mixture in a well-buttered pie dish and bake until set. Beat the whites of the eggs until stiff, sweeten with 2 tablespoons of sugar and pile on top. Place in a cool oven until pale brown, serve either hot or cold. The pie dish may be lined with pastry if a more elaborate pudding is needed. *Norfolk Pudding*: 2 or 3 apples, 2 tablespoons sugar, 1oz. butter, lemon juice and batter. Peel and core apples, place in buttered pie dish and fill the centres with sugar and butter moistened with lemon juice. Prepare a batter with 2 eggs, 2 tablespoons flour, a gill of milk, sweetened with 2 tablespoons sugar. Pour this over the apples and bake in a slow oven for three-quarters of an hour. Dust with castor sugar before serving. *Apple Fritters*: 2 or 3 apples, sugar and batter. Peel and core the apples and cut into sections. Prepare the batter as for Norfolk pudding, using rather less milk to ensure the batter being thick for coating purposes. Dip the apple pieces in the batter and fry in deep fat until brown. Drain thoroughly, dish, and dust freely with castor sugar. *Apple and Fig Roly-poly*: 2 or 3 apples, 2ozs. figs, 2ozs. sugar, pinch of nutmeg, ½lb. suet pastry. Peel and core the apples and cut the figs in strips (after being soaked if dry figs are used). Prepare the suet crust, roll this out and place apples and figs on it, roll up and tie in a scalded cloth. Boil 2 hours and serve with sweet sauce. *Apple Snowballs*: The remains of a cold rice pudding, 4 or 5 apples, castor sugar. Peel and core the apples and coat them with the mixture, which must be thick to mould round the fruit. Tie these in cloths or carefully place them in a steamer and cook for about ½ an hour until the apples are cooked through. Place on a hot dish, sprinkle very freely with castor sugar and serve with a little melted red currant jelly poured around. *Apple Cheese Cakes*: 1lb. apples, ¼lb. sugar, 1oz. butter, 2 eggs, a little grated lemon rind, ½lb. good pastry. Prepare the pastry and line some patty pans with this. Prepare the apple mixture by peeling, coring, and stewing the apples, add the sugar, butter, eggs, and lemon rind and stir well. Place a little of the mixture in each pastry case and cover with narrow strips of pastry, lattice fashion. Brush with white of egg and bake for 20 minutes to half an hour until nicely browned. *Fried Apples for Pork, Curries, or Sausages*: 6 apples, frying fat. Peel and core the apples and cut across in thick rings. Fry in hot fat for 5 minutes, drain and serve in a hot dish. *Apple Jelly*: 6doz. apples (large), ½lb. sugar, ½ pint water, 1 lemon, a few drops cochineal, 1oz. leaf gelatine. Peel, core, and stew the apples in the water, add grated lemon rind and juice, add the sugar and rub the pulp, if lumpy, through a sieve. Dissolve the gelatine in a little warm water and stir this into the apple mixture, add also the cochineal. Place in a wetted mould and allow to set. Turn out and serve with cream or custard. *Baked Apple Pudding*: Well butter a pudding basin and sprinkle freely with brown sugar, prepare a short crust and line the basin with this. Fill up basin with apples, sprinkle with sugar and lemon juice, and place a layer of pastry on top. Bake in hot oven and serve with sweet sauce. *Sweet Crust for Top of Apple Pudding*: 6ozs. of fine bread crumbs and 4ozs. of sugar. Arrange very closely in a pie dish, the apples peeled and cored, with sugar. Spread the mixture of bread crumbs and sugar upon the apples, smooth it down firmly, sift some sugar over the surface and bake in a quick oven about three-quarters of an hour. *Baked Apple Dumplings*: Peel 6 medium-sized apples very thinly and core them; do not cut them up. Put sugar and clove in each apple and roll pastry round each one. Place on greased tin. Bake slowly for half an hour. *Apple Pancakes*: 2 eggs, 2 cups milk, 1 cup minced apples, 1 tablespoon sugar, 1 cup flour, 1 teaspoon baking powder. Beat eggs well, add milk and gradually add flour to a smooth batter. Beat well, add sugar, apple and baking powder. Fry in a hot buttered frying-pan, dust with sugar and serve." (Secretary, Mrs. Cundy.)

WILLIAMSTOWN (Average annual rainfall, 27.71in.).

April 5th.—Present: seven members.

HOUSEHOLD HINTS.—Mrs. Hamilton presented the following paper:—"There is nothing better than a wad of cotton wool for giving the final polish to furniture and silver. It brightens without scratching, and can be thrown away and replaced when it becomes soiled, thus saving the washing of many dusters. A piece of thick brown paper, folded several times, saturated with vinegar, sprinkled with pepper, and applied to the side of the face will cure a severe toothache. Wrap a piece of flannel around the head to keep the poultice in place. When making a cake with butter, try beating into the butter a teaspoonful of olive oil; the cake will keep quite moist for a long time. The oil leaves no taste. For a small family a teacosy with a turned-up piece along the bottom is handy for keeping the breakfast eggs warm, thereby serving two purposes. When peeling apples for dumplings or stewing, put each one as it is cut into a basin with a little salt. This will prevent them from turning brown and soft. When stung by a bee rub the stung place immediately with a cut onion and it will neither ache nor swell. Spoons and forks which have darkened or discolored through use in cooking can be made bright again if boiled in the water in which eggs have been boiled. To make a success of rearing turkey chicks, feed them on milk curds. To coax a child who does not want to eat breakfast, beat up one egg into a cup of warm, sweetened tea; the egg done like this goes just the same as milk in the tea, and the child does not know any difference. To keep ants from a mulberry tree, paint the trunk with sump oil from a car or tractor. Place a saucer upside down in the bottom of a salad bowl. Any surplus water will trickle underneath and thus keep the salad from becoming watery at the bottom. To prevent a bedsore from developing on an invalid, beat an egg white and rub it on the spot three or four times, then pat some on and allow it to dry before powdering. Apply three or four times a day. If too much salt is put into food while cooking it, place a wet cloth over the top and the salt will be drawn into the cloth. A teaspoonful of sago cooked with the breakfast porridge makes it deliciously creamy, and only two-thirds of the usual amount of rolled oats are then necessary. When making dried apricot jam, add 1lb. of dates (stoned and chopped) to every 2lb. of apricots. Fresh geranium leaves placed in a bowl in a room keeps the room free from small flies; the flowers of the common red geranium are disliked by blowflies. Few things are better than the yolk of an egg for removing coffee, chocolate, or mud stains from material. Apply with a piece of flannel, then wash off in tepid water in which a little curd soap has been dissolved. If fish are wrapped in cabbage leaves or wet grass they will keep fresh almost as long as they will on ice." (Secretary, Mrs. Cundy.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Balumbah	1/3/33	9	"Jam Making," Mrs. Swan	Miss C. Riches
McLaren Flat ..	6/4/33	19	"Paper Flowers," Mrs. J. Foggo	Mrs. B. Elliott
Belalie	14/3/33	22	Address—Mrs. E. Bayley.	Mrs. A. Cummings
Kangarilla	16/3/33	9	Question Box	Mrs. M. Steer
Mangalo	12/4/33	10	"Hand Embroideries," Mrs. Coles	Mrs. F. Coles
Belalie	11/4/33	9	"The Future Women of Australia," Mrs. F. Cummings	Mrs. F. Cummings
Parrakie	24/3/33	15	Question Box	Miss J. Halliday
Gladstone......	21/4/33	16	"Travel Talk," Mrs. H. Alvey	Miss M. Sargent

MEN'S BRANCHES.

SOUTH-EASTERN.

WOLSELEY (Average annual rainfall, 17.44in.).

September 5th.—Present: 16 members.

Side Lines on the Farm.—Mr. W. Snoad read the following paper:—"Because of the present low prices for wheat and wool, farmers are paying more attention to side lines than they did when wheat and wool were at a better figure. Generally speaking, sheep are not a side line on a wheat farm, because they are necessary to help keep the fallows clean and free from weeds and pack the soil. They are also the main household meat supply. The breeding of fat lambs for export appears to be a good side line. The crossing of English rams with the Merino ewe is favored by the fat lamb breeders, the desired dressed weight of the carcass being 28lbs. to 35lbs. *Dairying.*—The most important side line on the farm is dairying. It is important to have a pure-bred sire at the head of the herd, one from a reliable breeder and from high producing ancestry. A few good cows well fed and looked after will pay better than double the number neglected and not properly fed. I give five cows a bag of oats a week with damped chaff, and about a match-box full of superphosphate twice a day. Unfortunately the price of dairy produce is not very high at present, but the returns for cream, &c., are ready money and help to balance the budget. It should be the aim of every dairyman to produce cream of the choicest quality, and this can only be attained by good feeding and cleanliness. *Poultry.*—So far as poultry keeping is concerned, the White Leghorn is recognised as the best layer of large eggs. The Black Orpington is a good winter layer, and also the Rhode Island Red; they are also splendid table birds. I purchased 200 day-old chicks, and with a brooder of my own make have been fortunate in not losing very many. Try and produce eggs of export standard, collect them frequently, see that they are clean, and get them to the market once a week in winter and twice a week in the summer. Small, dirty eggs spoil the sample; only the best eggs are fit for export. *Pigs.*—The Large White is a good pig; a quick grower and also a good baconer. The same applies to the Tamworth-Berkshire cross. The ideal bacon pig should weigh from 100lbs. to 130lbs. Quick maturing, long, lean, fine-boned breeds that can be made into baconers when about five months old are desired. The market for pigs is not very high, and the most profitable way to market them is to send them to a bacon factory already dressed."

On October 17th Mr. H. B. Barlow (Chief Dairy Instructor) gave a demonstration, "The Points of a Dairy Cow." Mr. A. G. Butler intimated that he would donate a trophy for the best 50 acres of wheat grown by a member of the Wolseley Branch.

Breeds of Sheep.—Meeting held February 15th. Present: 14 members. In the cause of an address on the above subject, Mr. J. Sullivan said the Lincoln was necessary as a foundation for long wool breeding. The English Leicester was not very successful in the Tatiara. The Shropshire was rather too woolly on the face, and had been supplanted by the Border Leicester, but the latter had been condemned as being too long in the ribs for the English market. The Romney Marsh was noted for its firm dark foot, the finest foot of any breed of sheep. This breed produced a nice type of wool. The ewe from the Romney-Merino cross was the best mother for export lambs. The Romney should be a suitable sheep for the South-East on account of its sound feet. The Suffolk was likely to be a very useful sheep, the lambs were very quick growers, but it was doubtful whether they would be suitable for the Wolseley district. The pure bred sheep of this breed were not good "doers" on dry feed; they lost condition quickly after the flush of feed went off. The Hampshire turned out the best of five breeds which were tried out at Wild Horse Plains and Pinnaroo. South Australia had the best Dorset Horns in the Southern Hemisphere. They were condemned by the English market on account of too large a bone, but would probably do well in light soil. The Shropshire was a good breed for the production of export lambs. The Southdown grew the best wool of the short-wool breeds, the lambs were not over large, but of excellent quality and shape. The Corriedale bred from a Lincoln-Merino cross was now a fixed pure breed with 70 years' breeding behind it. The Corriedale and Polworth he thought would be the breeds that the Merino would have to fight against to maintain its present position. The typical Corriedale had a black hoof. In wet country and western Victoria it should be an ideal sheep. He said there was a greater demand for wool of a 56's quality than finer wools nowadays, and that was the type of wool the Corriedale produced. He spoke very favorably of this sheep, and read letters from some of the largest spinners in the world with regard to the value of this quality wool. (Secretary, E. Sharrad.)

MOUNT GAMBIER POTATO CROP COMPETITION.

In the course of his report on the fifth Annual Potato Crop Competition for the trophy presented by Messrs. Wm. Hay Limited, the Judge, Mr. H. H. Orchard (District Horticultural Instructor), says that of the 10 entries received four were withdrawn because of unfavorable weather experienced as the season advanced.

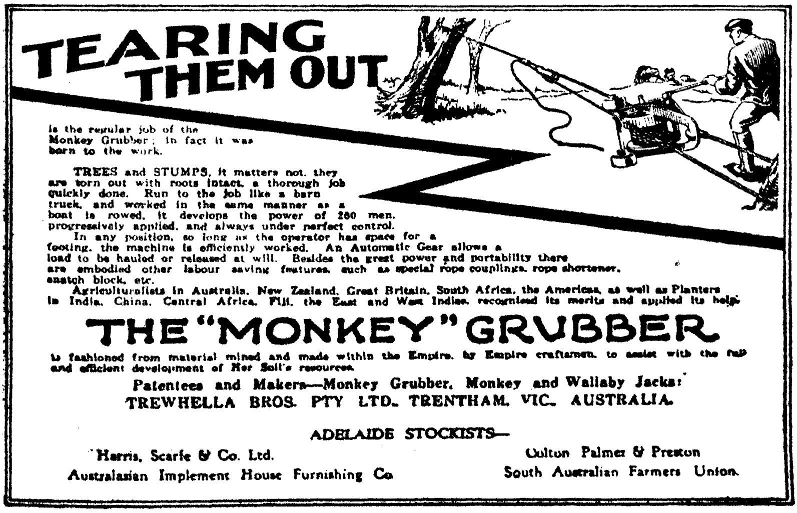
A pleasing feature of the competition was the purity of the crops. Previous competitions set a high standard, but this year excelled all previous results.

RESULT OF THE COMPETITION.

Competitor.	Variety.	Yield.	Quality.	Type and Purity.	Freedom from Disease.	Freedom from Weeds.	Evenness of Crop.	Total.
	Maximum—	35	25	10	10	15	5	100
Gambier Clover Estates, Ltd.	Carmen ..	35	24	10	8·5	14	4·5	96
Do. ...	Up-to-date	31	24	10	9·5	14	4·5	93
Medhurst, A. G. ...	Carmen ..	29	22	10	9	14	3	87
Telfer, F. A.	Carmen ..	26	22	9·5	8	14·5	5	85
Telfer, F. A.	Up-to-date	23	22	10	9	14·5	5	83·5
Kannanberg W.B.	Carmen ..	21	24	10	8·5	13	3	79·5

All crops are recommended for seed.

The winning entry was grown on section 518, hundred of Gambier, on brown sandy loam not previously cropped. Germination was good, plants stooled very well, and made strong, healthy growth without rankness. Tubers were of very good shape and quality. There were traces of blight, blister, and scab, and a quantity of tubers under competition weight. Land was first skimmed in February and then pulverised in November. Cut seed was planted on December 6th, and the land dressed with 6 and 1 super and ammonia at the rate of 7cwts. per acre. Harrowing was done when young plants were just showing through, the crop being later cultivated and moulded.



TEARING THEM OUT

is the regular job of the Monkey Grubber; in fact it was born to the work.

TREES and STUMPS, it matters not, they are torn out with roots intact, a thorough job quickly done. Run to the job like a barn truck, and worked in the same manner as a boat is rowed, it develops the power of 200 men, progressively applied, and always under perfect control.

In any position, so long as the operator has space for a footing, the machine is efficiently worked. An Automatic Gear allows a load to be hauled or released at will. Besides the great power and portability there are embodied other labour saving features, such as special rope couplings, rope shortener, snatch block, etc.

Agriculturalists in Australia, New Zealand, Great Britain, South Africa, the Americas, as well as Planters in India, China, Central Africa, Fiji, the East and West Indies, recognised its merits and applied its help.

THE "MONKEY" GRUBBER

is fashioned from material mined and made within the Empire, by Empire craftsmen, to assist with the full and efficient development of Her Soil's resources.

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Australasian Implement House Furnishing Co.
Colton Palmer & Preston
South Australian Farmers Union.

The trophy has to be won three times by the same competitor before being won outright. Previous winners being—

Season.	Competitor.
1928-29	F. A. Telfer
1929-30	C. W. Patzel
1930-31	B. Kannenberg
1931-32	F. A. Telfer

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Allandale East	10/3/33	8	Annual Meeting	J. Laslett
Wolseley	17/10/32	16	Demonstration—H. B. Barlow	E. Sharrad
Wolseley	12/12/32	11	"Rotation of Crops," G. Butler	E. Sharrad
Penola	7/4/33	9	"Killing and Dressing of Sheep," E. Hinze	F. Hinze
Mundalla	13/4/33	25	Address—Dr. E. Broadbent	A. Ross
Mount Gambier	7/4/33	12	Address—A. R. Hilton	G. Gurry
Penola	7/4/33	11	"Wattle Bark Growing," T. Earl	J. Laslett
Wolseley	11/4/33	14	Discussion	E. Sharrad

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WARCOWIE (Average annual rainfall, 11.42in.).

March 9th.—Present: 12 members.

Harvest Reports.—The following reports were received:—T. Ryan, 430 acres sown, averaging 6bush., the highest yield being 12bush. and lowest 2bush. W. A. Crossman, 200 acres sown, average 7½bush., highest yield being 15bush of Nabawa on summer ploughing, and Ranee 12bush. and Federation 12bush. on fallow; Federation, Nabawa, and Onas on stubble, 6bush. Messrs. N. W. and A. F. Crossman, 380 acres sown Onas, yielding 14bush. on fallow; Nabawa 9bush.; Ford and Ranee on fallow 7bush.; other lots down to 3½bush., averaging a little over 6bush. E. C. Jarvis, Nabawa 12bush., Sultan 10½bush., Ranee 9bush., Ford 8½bush., Algerian oats, 40 acres, average 4 bags. Messrs. E. L. Orchard, F. C. Richards, and Dr. Krause then gave short addresses.

WEPOWIE (Average annual rainfall, 12.46in.).

March 20th.—Present: 10 members.

Tree Planting for Shade and Timber.—Mr. T. Orrocks presented the following paper:—"When the early settlers first took up land for the purpose of wheat growing in most districts of South Australia they gave but little thought to saving any trees to provide shade for stock, and many trees were felled on the rough portions of some farms that were not suitable for wheat growing. Many of the trees that were left along the creeks, such as native pines, sheaoak, &c., are dying, and as most farms carry a flock of young sheep, young native trees do not get a chance to grow. For this reason, all landholders should plant and fence a few trees every year. During the last drought it was useless to attempt tree growing, but now that the seasons have changed, this should be carried out by every farmer. It is not a difficult matter to grow sufficient trees for one's own use. Sugar and red gums and pines are easily grown and home grown trees, especially if grown in tins, do not receive any noticeable check when planted out in suitable weather. They can be planted out at any time of the year after a rain, or if water is available. If only planting a few at any particular place, holes should be dug sufficiently deep to allow the soil that the tree is growing in to be a little below soil level. If the area to be planted is large enough, then a plough is favored for preparing the land. It is not advisable to plant too many trees at once on account of the expense of fencing. It is better to have one tree well fenced than a number not well protected, because ultimately stock will break in and spoil them. There are many watercourses where redgums would grow luxuriantly and not interfere with any of the farm operations. They will provide shade for stock, beautify the country, and enhance the value of the property.'' Members in general agreed with the writer and stressed the fact that future supplies would diminish if replanting was not more seriously considered, for the local hills, which had provided wood in the past, were being denuded of timber.

Harvest Reports.—Mr. J. Crocker reported having obtained a 16bush. farm average, Ranee being the best yielder, up to eight bags, Sultan 11bush., and Canberra 9bush., Nabawa on stubble 11bush. Mr. A. Whibley reported Felix 24bush., Noongaar 18bush., Waratah 20bush.; Ranee over an extended area was very patchy, as was also Currawa. Nabawa did not yield to expectations.

Over-Production.—Mr. J. Crocker read the following paper at a meeting held on April 3rd.—''While there is a surplus of primary products in the world, that surplus has been caused, not by an excess of production, but by the limited purchasing power of the people. A great deal of publicity is given to world surplus of wheat, and yet millions of people have not enough of it. Producers have been faced with a slump in prices of wool, and yet it is scarcely an exaggeration to say that in England alone there are enough people who are insufficiently clad to stabilise the wool markets of the world with their wants supplied. Again, in the local market can be seen the same effects of a financial depression. It would seem that there is no such thing as over-production in the primary industries of the world to-day, since, while it is true that if every man had the means to supply his needs, the surplus would disappear. This can only come through increased employment, which in its turn means extra production. Effective control of production seems impossible; producers have to submit to the law of supply and demand, prices in their turn regulating the demand to meet the supply. Still a great deal is being done towards, partially at any rate, overcoming the calamity of glutted markets. First by improved methods of storage and preservation which allows products to flow evenly on to the world's markets, and secondly by developing the channels through which the goods must reach the consumer. Improved methods of transport, the developing of present markets, and the opening of new, both in our own land and abroad, not only make for freer distribution, but by providing employment in some small measure relieve the labor market.'' (Secretary, E. Roocke.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Warcowie	11/4/33	20	Paper from *Journal*	A. Crossman
Morchard	7/4/33	9	" Harvest Preparations," R. Llewellyn	A. McCallum

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

BLYTH (Average annual rainfall, 16.76in.).

March 31st.—Present: 16 members.

Care of the Tractor.—The following paper was read by Mr. W. Brereton:—''The tractor responds to the treatment it receives in much the same manner as a horse, only in the power unit the effects of care or abuse are more immediately noticeable, and effects are more serious. The proper treatment of tractors is, therefore, essential to their long life, reliability, and economical service. Before overhauling—and while the tractor is still hot—drain off oil and water so that any foreign matter has a better chance of leaving the tractor. When removing the head, loosen each nut gradually until the pressure is off all nuts—taking each nut right off as they are loosened may lead to distortion or cracking of the head. The first time that the tractor is taken down mark the valves and tappet rods with a suitable tool, so that they can be put back in the same place. Dismantle the valve springs, remove the valves and all carbon deposits. Examine the valve stems, and if any are pitted or bumped up against the head, replace with new ones. Grind in the valves, making sure that they are all seating correctly, but before assembling, wash out all grinding paste with kerosene. Oil the valve stem lightly to prevent it from sticking and closing too slowly. Remove the pistons and clean the carbon from the top and under the rings, and see that the rings move freely in their grooves without jamming. Sometimes it will be noticed that the metal bearings on the connecting rods are loose. In this case knock out the rivets and pack with some material to take up the play, because a good fit is not possible when the metals are loose. Before replacing the sump, examine the oil pump and make sure the pin that goes through above the ball is in good order; if it breaks or wears through the pressure of oil to the main bearings will not be sufficient. When replacing the sump, a set of box spanners with a ratchet handle that slips over the set handle is a very useful tool for reaching the awkward places and tightening the studs. The ignition should be examined periodically, and if the breaker points are pitted, file them to a flat and true surface. The carburrettor needs cleaning and adjusting occasionally. Set the jet so that the engine idles and does not crawl from one stroke to the next. If the mixture is too rich, more kerosene than can be vaporised passes into the combustion chamber. This results in the unvaporised kerosene passing the rings, taking the oil with it, there is more wear on the rings and walls, and greater crankcase dilution. Strain the kerosene through a fine gauze strainer—very often the light steel drums contain a fair amount of rust, and if this passes to the carburrettor it will mean loss of time stopping to clean it. Always use clean rainwater in the cooling system and keep it well filled. Drain the water off every two or three months, according to the condition of the water or the amount of work done. When the water has been drained and it is noticed that grease or dirt still remain, a solution of washing soda—about 1lb. to the gallon of water—put in and the tractor worked for two or three hours should remove it. If the air filter is not kept in good condition, particles of dust will enter into the mixture and into the cylinders, acting as an abrasive on the pistons, rings, and cylinder walls, making rebores necessary more frequently. Dirty filters also restrict the inlet of air and tend to give too rich a mixture. A few points that may be worth keeping in mind: (1) Change the oil every 60 working hours or oftener. (2) Use the correct grade of oil and keep filled to the proper level. (3) Clean the oil screen every six months. (4) Keep the ignition system in good order. (5) Do not work tractor on too rich a mixture. (6) Do not overfill crankcase with oil. (7) Cease to operate the engine when it continues to misfire. (8) Always remember that oil and grease are cheaper than bearings. (9) Use only clean rainwater in the radiator. When other water is used, drain out every few days to clear out the sediment which may collect in the tubes and block them—causing overheating of the engine.'' (Secretary, L. Mugge.)

EVERARD EAST.

March 8th.—Present: six members.

A Review of 1932.—Mr. F. Hughes (Hon. Secretary) read the following paper:—''The early part of the season opened with hot weather, and proved to be the forerunner of a wet winter. January was very dry, only two damp days with 8 points of rain being recorded. February opened wet, with 131 points on the 5th and three other showery days, making a total of 154 points for the month. March also had four wet days, giving only 61 points. April was very wet, with rain falling on 11 days—a total of 226 points. This gave feed a good start. Rubbish germinated freely, making it very difficult to kill weeds during seeding. May was also fairly wet, with 114 points, but only five rainy days. Some rather drying days resulted in an irregular germination in some of the poorer class of soils, both on fallow and stubble land. June was also wet, 15 days' rain totalling 265 points. There were also three very heavy frosts during the month, but as most of the crops were barely out of the ground they were not of much value. July and August were both wet, but the weather was mild, with 11 wet days and 132 points, and 13 wet days with 135 points respectively. Crops made excellent growth, which was very soft and sappy. September also registered some good falls, giving another 264 points spread over six days. Crops kept moving during October, with eight wet days and 107 points, leading farmers to expect big crops. Red rust, however, made its appearance, and continued to increase right on through November, which was almost rainless, only registering 9 points in two falls. Rust, so far as cereal results were concerned, reduced crops by two bags to the acre, and in some cases more. December was very cool, 58 points falling, which was spread over two days; a total of 15ins. 33 points for the year. Rust and late frosts probably reduced the cereal yield of the district by 50 per cent. Stock have done well during the past year, particularly sheep, cutting fleeces of bright, clean wool, and a good percentage of strong, healthy lambs.''

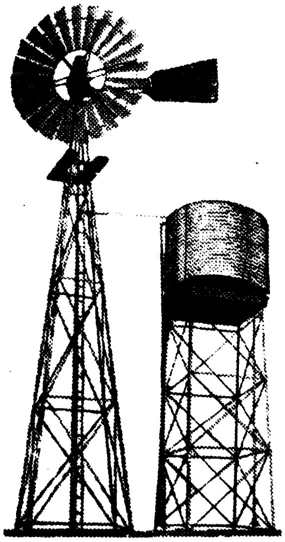
MURRAYTOWN.

March 11th.—Present: Seven members.

Selection and Care of Farm Plant.—The Hon. Secretary (Mr. E. Pitman) read the following paper:—''As the majority of the farms in this district are more or less hilly, this paper is intended to deal with the selection of implements for land of that nature. A fairly strong plough of not more than five or six furrows to take P shares is favored, with a hillside lever to be raised or lowered as occasion demands. Stump jump set harrows soon become broken on stumpy or stony land, they should be good for five years' work before having to be relaid. A cultivator with a high clearance is preferred for the first working to allow rubbish to pass through. Subsequent workings will probably be done with the combine. When working the combine, see that at all times the tines are kept properly spaced, and do not use the same shares too long without having them drawn out, or weeds will be missed. An 8ft. header or harvester is wide enough for taking off crops on uneven land. The implements mentioned are essential, and, as funds permit, they may be added to by a sundercut, which is very useful for working hard fallow or for dealing with stinkwort, paddy melons, &c. At times a land roller is also useful. When the purchase of any new type of machine is contemplated, endeavor to inspect one working under similar conditions to those which apply on your own farm before ordering. Keep all bearing and working parts supplied with oil, and when not working, house the machines in a good weather-proof shed."

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Jamestown	27/3/33	10	Annual Meeting	R. B. Phillips
Redhill	11/4/33	8	"Blowfly Pest"	H. Crouch
Jamestown	24/4/33	14	Address—J. O. Hatter ..	R. B. Phillips



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LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

BROWNLOW.

March 8th.—Present: 14 members.

HARVESTING OPERATIONS.—Mr. F. Woithe read the following paper:—"Preparing machinery for harvest is a matter that needs attention, otherwise valuable time may be lost when the crop is ready to harvest. The binder is generally the first implement that is used, the canvasses should be examined, and any torn places patched. Overhaul the knife and replace any broken blades. It is a good plan to have two knives, and the fingers should be tightened so that the knife runs freely. Hay cutting should commence when the grain has fully developed. *Harvesters*: All belting should be treated with oil to make them grip and prevent them from tearing. The driving chains should be adjusted, stretched links removed and replaced by new ones. The elevators should be thoroughly cleaned, the comb adjusted. Strips of leather placed around all pulleys will prevent belts from slipping. All bearings should be tightened and worn ones replaced. Generally oats and barley are the first to be harvested, great care should be taken when reaping barley to see that the winnower is not blocked. Oats do not require as much blast as wheat and barley. Wheat is easy to reap; harvest it off as quickly as possible, because there is always the danger of fire or hail. Bags should be removed from the stubble as soon as possible, because the grain loses weight if left exposed to the sun for a long time." (Secretary, F. Roocke.)

NANTAWARRA (Average annual rainfall, 15in.).

March 16th.—Present: Eight members.

THE FUTURE OF THE WHEAT INDUSTRY.—Reading a paper on this subject, Mr. R. Uppill said this question was foremost in the minds of all growers at the present time; much consideration had been given to putting the industry on a sound footing, and Governments had realised the need for keeping growers on their holdings. Organised control was advised in some quarters, and the restriction of the area sown. Mr. Uppill's opinion was that farmers must continue to grow wheat, because eventually there would be a period of higher prices. Sidelines such as sheep, cows, pigs, and poultry should also be kept going. Recent events had shown that pools, quota systems, &c., had ended in failure. Assistance could be given wheat growers through tariff revisions, the abolition of the arbitration courts, reductions in all forms of taxation, cheaper money, and reductions in freights. That would bring down the cost of production, which would enable wheat growers to carry on and compete with growers anywhere in the world. Mr. A. Durdin thought that the only way of reducing the cost of production was by reducing tariffs, &c. Mr. A. Herbert thought the only way was to keep on growing wheat. Going out of the market altogether would not affect the price of wheat in Australia. Mr. Robinson said the present generation were realising the situation, and instead of overcrowding the cities were seeking a living in the country. Improvement must come the wheat growers' way first. (Secretary, W. J. Hamdorf, South Hummocks.)

TRURO (Average annual rainfall, 19.96in.).

March 20th.—Present: Nine members.

HARVEST REPORTS.—Mr. P. Klemm—winner of the Local Crop Competition—reported that the competition crop of Dan returned 8 bags per acre. Mr. W. C. Johnston estimated a return of 11 bags at the time of judging, which illustrates the poor termination of the growing period for wheat in this district this year. Derby yielded 7 bags, and Federation, although very poor, yielded about 7 bags. Oats were all cut for hay, owing to lodging. Seed sown, 75lbs. wheat with 75lbs. super on fallow ground. Mr. L. Miller: Gallipoli, that obtained 2nd prize in the competition, returned 22bush.; Wannon, 14bush. The samples weighed very light and were pinched. Nugget on ploughed ground yielded 22bush.; Algerian oats on ploughed ground, 12 bags. 1cwt. 45 per cent. super and 70lbs. wheat sown at Frankton, Nabawa, Ranee, and Gallipoli returned 18-19bush. on fallow. Mr. H. Klemm: The third prize winner, with Dan, 25bush.; Sword, 24bush.; Beringa, 24bush.; Gallipoli, 21bush.; Sultan (affected by rust), 16½bush. on fallow; Nabawa, 14bush. Dan on ploughed ground, 15bush. Lachlan oats, though wind shaken, 6 bags. There was plenty of straw, but the crops did not yield as they appeared. Wheat sown 75lbs. with 86lbs. super. Mr. J. Schilling: Leak's Rustproof, Derby, and Sword each 10bush., sown on fallow with 70lbs. seed, 93lbs. super. Wheat weighed light, and was badly affected with take-all during October-November. Joffre wheat gave a sample little bigger than caraway seed. Mr. E. Schilling: Sword, 24bush.; other wheats, 16-18bush.; with 3bush. on ploughed ground—83lbs. seed, 90lbs. super used. One of the worst seasons in the Moculta district for years. Take-all reduced the apparent yield of crops from 30bush. to 18bush., but the grain was a good sample. Mr. T. Kupke: The season's beginning was the best for years, but crops did not turn out as well as anticipated. Take-all was very prevalent.

Derby and Gallipoli averaged 6 bags on fallow. Sown at rate of 70lbs. seed and 90lbs. super. Oats were very poor. Mr. W. Scott: Nabawa went off suddenly and lodged badly, but yielded 5 bags; Nugget, 17bush.; Gallipoli, 18bush.; Dan, 15bush. (on fallow stubble ground); Daphne, 14bush.; and Nabawa, 7bush. Seeding, 90lbs. super and 75lbs. seed. Sword and Gallipoli on a test plot averaged 9 bags. Nugget and Bluey were failures. Barley, 23bush.; oats, 19bush. Mr. L. Davis: Gallipoli on ploughed ground 6bush., sown at rate of 75lbs. seed and 90lbs. super. Barley, 7 bags. Mr. M. Tohl: Experimental plots at school were not a very great success. Wimmera rye grass proved the best fodder plant, the others being smothered with weeds. (Secretary, L. Davis.)

ENSILAGE.

[*Paper read by W. McAuliffe at the April meeting of the Buchanan Branch.*]

ITS MANUFACTURE AND UTILISATION.

The average farmer's cows seldom receive the attention and care that is due to them. In these times of low prices for all products the cow has played a prominent part in not only the salvation of many families, but also in the finances of the Commonwealth. Surely, then, it behoves producers to play their part and give the cow at least sufficient good food to enable her to produce at somewhere near the top of her capacity. This could easily be done on any farm, by reserving the surplus feed in the flush periods, and using it in the dry months and early winter. The best way to reserve this surplus fodder so that it will retain its succulence is by making it into ensilage. A stack of good ensilage and a supply of oats for crushing is the best insurance against poverty for the man who is milking a few cows.

ITS ADVANTAGES OVER HAY.

Ensilage has this great advantage over hay—it can be made just when the material is ready, which is always before the usual haymaking time, and does not interfere in any way with the harvest routine. Weather conditions do not retard work at the ensilage stack, so long as it is not too wet for the binder or clipper to work. The fodder being wet when it goes into the stack does not in any way harm it. Ensilage has the further advantage over hay, that a great deal of coarse grass, thistles, Salvation Jane, &c., which would not make good hay can be converted into fair ensilage, especially if stacked before it loses its succulence, because the process of curing softens the hard stems, and makes them palatable to stock. Ensilage will keep for a number of years, does not become infested with mice or rats, and is safe from fire. For feeding to cows before calving it is excellent, and puts them into wonderful condition with plenty of bloom on them. Cows fed on ensilage have a mellow appearance as compared to those fed on hay; their skins are looser, they calve and clean-up better, and come to profit more quickly.

TIME TO CUT.

As in the making of hay, ensilage should be cut at the right time, grasses should be cut just as they are coming into flower, cereals just when the grain is thickening from the milk to the dough stage. Cutting the pastures at this stage has the further advantage of inducing a second growth of good rich grass, which is much more nutritious than old grass, and also retains its greenness longer. The better the fodder put into the silage stack the better the ensilage will be; poor fodder, low in proteins, cannot make first class ensilage—though Salvation Jane, which is looked upon as a curse on most farms, makes really good feed when utilised in this way, especially if made up with a mixture of other grasses. When making ensilage this year I cut a load of Salvation Jane as an experiment, with wonderful results. When it came out of the stack it had lost all of its hairyness, and the cows cleaned up every stem of it when it was fed to them.

EFFECT ON DAIRY COWS.

By using ensilage, with crushed oats, I have been able to reduce the feed bill by at least 33 per cent. without detriment to the cream cheque. My cows are under official test, and it is a simple matter to check results of different feedings. It will take a good deal of inconvenience to prevent me from making at least one large stack of ensilage every year. I have cows that have freshened in spring in the full flush of feed that have produced more butterfat on ensilage in February and March than they did when calving. Last year I had a heifer calved at the age of one year and seven months, and under official test she produced 365lb. of butterfat in 273 days, equal to 430lb. of commercial butter, or an average of 11lb. of butter per week for 39 weeks. Without ensilage this baby heifer would not have done nearly so well.

STACK SILAGE.

When I started to make ensilage I considered the three different methods of storing it—silo, pit or trench, or stack. I decided on the latter, because it suited my conditions best and was the cheapest, although there appears to be more waste with stack silage than with either of the other methods. The implements used were a grass mower, horse rake, and a slide on old binder wheels for drawing the material to the stack. At the stack I used a wheat elevator to run the grass up—the latter, however, is not essential. The previous year I forked it all up off the wagon; it was hard work, but results fully justified this labor. The main principles to be observed in making ensilage are to only cut as much in one day as can be handled on that day, so that it will go into the stack without losing any of its freshness. Immediately it is cut it should be raked and carted and at least 3ft. to 4ft. built on to the stack each day, and not more than 5ft. or 6ft. The amount going on at one time governs the heating of the mass, and it is this way that either sour or sweet ensilage is made. Putting, say, an average of 5ft. on each day, the stack should be kept going for 10 to 14 days. After the first few days the stack settles very quickly—sometimes as much as 4ft. in 24 hours. As soon as the stack is completed it should be well weighted down; this is one of the most essential points in the whole process. There are several ways of doing this, but stone is the easiest handled, because it can be thrown up. There should be at least 18in. of stone to get the necessary weight. The stack can be opened up and fed to stock a few weeks after completion, but is better if left for a time. Ensilage deteriorates rapidly when exposed to the air, and for that reason a little should be taken off the stack each day. Only a small amount should be fed to the cows for the first few days until they become used to it; afterwards as much as 40lb. per day can be fed. There is always a certain amount of mould in stack ensilage, but the cows will eat it, and it will not cause any ill-effects. It is not safe, however, to feed it to horses.

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Greenock	13/3/33	40	Address—W. J. Spafford.	A. Schubert
Roseworthy ...	13/2/33	19	Cinema Lecture—"Cement"	S. Bowden, Sheoak Log
Roseworthy ...	6/3/33	21	Address—D. N. Martin ..	S. Bowden, Sheoak Log
Lyndoch........	7/3/33	16	Address—Mr. Kingswood	J. Hammatt, Williamstown
Lyndoch.......	4/4/33	10	Discussion	J. Hammatt, Williamstown
Black Springs ..	3/4/33	15 and 36 visitors	Address—J. O. Hatter ..	K. Dunn
Adelaide	13/4/33	14	Address—W. J. Spafford.	J. Hewland
Upper Wakefield	6/4/33	13	Debate	C. Neumann, Halbury

YORKE PENINSULA DISTRICT.

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Sth. Kilkerran .	23/3/33	12	Address—W. J. Spafford.	R. Hasting
Sth. Kilkerran .	29/3/33	—	Address—H. Gepp	R. Hasting
Kilkerran	11/4/33	7	"Seeding Preparations," C. Hill	E. Koch
Brentwood	2/3/33	10	"Developing Scrub Lands," L. Watters	A. Carmichael
Brentwood	28/3/33	8	Address—Mr. Gepp	A. Carmichael

WESTERN DISTRICT.

GREEN PATCH (Average annual rainfall, 26.56in.).

March 9th.—Present: 14 members.

Top Dressing Pasture.—Mr. Derrington asked if it was advantageous to wait for autumn rains before starting top dressing, or were results just as good if the ground was top dressed when quite dry. Mr. T. Murray had top dressed in April—before the rush of seeding work—and did not think later top dressing would give any better results. He mentioned that in the early days of using super on crops he followed the practice of broadcasting super by hand on fallow before seeding started with most satisfactory results. Mr. P. Sinclair was of opinion that July top dressing gave better results than April, and Mr. Schwerdt agreed with him.

Manganese Deficiency.—Mr. E. Sage, who has limestone country, stated that his country was undoubtedly deficient in manganese, and that for the past three years he had been getting excellent results from the use of manganese sulphate as a fertiliser on cereal crops. He used 28lbs. per acre, and considered that it fully doubled his crops. He also found it made a wonderful improvement in his fruit garden.

Mr. Derrington asked for advice regarding quantities of seed per acre for wheat, oats, and barley. Mr. T. Murray recommended 70lbs. per acre for all three. Most members present considered 1bush. for wheat and barley and 1¼bush. to 1½bush. for oats the best seeding, and that the quantity of seed was dependent on its grading, the cleanliness of the prepared land for seeding, and the time of seeding—late seeding being somewhat heavier than early. (Secretary, C. J. Whillas.)

KELLY (Average annual rainfall, 11.53in.).

March 11th.—Present: 11 members.

Seeding.—Mr. I. Grunds (Hon. Secretary) read the following paper:—"The farmer should be most particular as to how and when he puts in the seed, and it is essential that suitable preparations be made before starting operations. See that the ground which is to be sown is not dirty. If the previous crop was affected with 'take-all,' sow oats or fallow the land in readiness for the coming year. Land which was fallowed the year before, and is not too dirty, can be sown, because very often it grows a good crop the second year. Do not sow 'old' land three times in succession. New land will stand three crops following, and generally grows the best crop the third year. Then the next point is the selection of wheats and the preparation for sowing. In a late district late wheats are invariably the best. For this district sow early varieties only, as they reach maturity much sooner, and, therefore, eliminate the necessity for late rains. Grade and pickle the seed to ensure freedom from smut. Commence seeding early in the season in order to receive the full benefit of the early rains, and much will have been done to ensure a bountiful harvest."

MALTEE.

March 9th.—Present: 12 members.

Harvest Reports.—Mr. C. Schwartz stated that Merriden was his best variety, yielding 19bush. Late Gluyas sown by Mr. H. Martin returned 15bush. Most crops in the district were decreased by mice, rust, and take-all. (Secretary, E. Schwartz.)

MOUNT HOPE.

March 21st.—Present: Nine members.

Preparing the Seed Bed.—Paper read by Mr. A. Vigar:—"The successful culture of wheat depends entirely on the work done on the land long before the seed is sown. Tillage of the soil is under man's direct control, whereas weather conditions are not. The ground must be reasonably free from stumps, stones, weeds, &c. This is not always possible on new land, or when converting pasture land to wheat growing. Ploughing is not necessary, although it is often advisable to use some heavy implement to root out stumps, stones, &c. In properly cleared land a good burn over the dry grass at this time of the year makes ploughing needlessly expensive. For a given expenditure of energy, more work can be done with a good tine cultivator than either a disc or a mouldboard plough, and results are equally satisfactory. In some soils it is advisable to work the land before winter, because the rains cause the surface of the ground to consolidate. Then run the cultivator over again when weeds show above the ground, and wait a few days before working the seeding implements. With other soils it is impossible to work them dry, owing to either the hardness of the soil or the stiff soil cutting the share blades to pieces. Care must be exercised in working the soil, for if on the wet side there will be a decided tendency for the clayey constituents to run together and ruin the good work that has been done. With the former the chief risk is that during working the soil may be set down and clog the discs, tines, or mouldboards, and leave a poor job when in very dry weather there is a very decided tendency for the soil to powder and drift. The above operations are best carried out at a depth of from 1½in. to 2in., thus allowing the grain to fall on the hard seed bed. For seeding the combine appears to give best results, because the soil is thoroughly rooted up and any freshly germinated weeds exposed to the sun and killed. In some cases it is necessary to use a disc drill to clear rubbish. *Fallowing.*—Although the above remarks are meant for sowing straight after ploughing, they are mostly applicable to fallowing, except as regards burning off, since most of the fallowing is done after seeding.'' (Secretary, A. Myers.)

TARAGORO.

March 9th.—Present: Five members.

Blacksmith Shop on the Farm.—Mr. W. Whittaker read the following short paper: —''One of the most useful units of the farm equipment is a blacksmith shop, preferably built of iron and stone. The set of tools should include a forge. A piece of pipe running through an old galvanized tank, with bellows attached, will make a good forge; two ⅜in. holes ⅝in. apart should be bored in the pipe to give a good blast. There should be a window in the shop to provide plenty of light, and one side with swinging doors, so that long pieces of iron, &c., can be heated at the forge. A carpenter's bench and tools will prove most useful. Farmers can save many pounds in repairs by doing small jobs on the farm, especially where horses are used and swings and eyebolts are continually wearing out. Blacksmithing is not an easy job; much time will be spent in learning to be a good blacksmith, but one learns with experience, and it is a good hobby for any man on the land.'' (Secretary, T. Winters, Cleve.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Laura Bay	14/3/33	8	Harvest Reports	W. Edson
Maltee	6/4/33	9	Discussion	E. Schwarz
Kapinnie	6/4/33	10	Question Box	O. Green
Chilpuddie	5/4/33	8	Inaugural Meeting	D. Caust
Balumbah	5/4/33	—	Question Box	A. Jericho
Wudinna	10/3/33	8	Harvest Reports	D. Duguid
Wudinna	7/4/33	7	Address—W. H. Brownrigg	D. Duguid
Kyancutta	4/4/33	19	Address—W. H. Brownrigg	J. Dyke
Kelly	15/4/33	11	Question Box	I. Grund
Goode	12/4/33	14	" English Farming," A. Howlett	B. Linke
Yadnarie	11/4/33	10	Address—F. Vaughan ...	E. Spriggs
Green Patch ...	6/4/33	9	Discussion	C. Whillas, Port Lincoln
Miltalie	21/3/33	9	" Ancient Farming," A. Wilson	G. Smith

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

March 18th.—Present: 21 members.

Burning Off.—Mr. H. White read the following paper:—''On all farms, whether properly settled or only in the course of development, some 'burning off' has to be done practically every year. The farmer who contemplates cropping grass land finds it advantageous to burn off the grass and rubbish—if it is thick enough to carry a fire —before working the soil in order to allow the implements to make a thorough job. Quite frequently stubble has to be burnt to enable a second crop to be grown, or perhaps fallowing to be carried out. On scrub farms the burning of grass and stubble for scorching shoots and the burning of rolled scrub are most important items on the year's programme. In every one of these cases certain precautions must be taken to keep the fire in hand, and also to enable the work to be carried out as satisfactorily as possible. When doing this work the first consideration is breaks. The Bush Fires Acts of 1913 and 1926 stipulate that when burning stubble, 'before the fire is lighted the land immediately adjoining on all sides of the land on which the burning is to take place must be ploughed throughout the whole length on every side to a width of at least 6ft., or must be cleared throughout the whole length on every side of all scrub, stubble, and other inflammable material to a width of at least 12ft.' When dealing with scrub, the Act says: 'Before the fire is lighted a space at least 15ft. in width immediately adjoining on all sides the land on which the burning is to take place must be either ploughed or cleared of all inflammable material.' If the stipulations of the law for stubble burning are carried out there should be very little danger of the fire getting out of hand, particularly if the fire is started in the correct way. For scrub burning, however, the 15ft. break as required by the Act is inadequate, and at least a 3 chain break on the danger side is necessary. Breaks, whether for scrub or stubble, should be burnt back against the wind which prevails at the time of doing it. For instance, if it is desired to make a break on the southern side, choose a day when a north wind is blowing. A fire which is burning against the wind is not nearly so fierce as one burning with it, and consequently is more easily controlled. The best time of the day to burn breaks is late in the afternoon, for by that time the wind is usually mild and settled in some definite quarter. To burn breaks when the wind is chopping is courting disaster. Having completed the break, the next consideration is to choose a suitable day. For all burning a hot, reasonably strong and consistent wind from the north is best. Hot days with frequent lulls in the force of the wind should be avoided, for whirlwinds are then usually prevalent and may carry the fire over even the most carefully prepared break. Having chosen the day, the next consideration is to light up. The Bush Fires Acts requires that before lighting either a scrub or stubble fire that 'not less than 12 hours before the fire is lighted notice of intention to burn must be given to every owner or occupier or person in charge of any land or building immediately adjoining the land on which the burning is to take place or separated from it by a road, if the owner or occupier or person in charge resides within five miles of that land, provided that, if the road is metalled to a width of more than 10ft., then a notice is unnecessary. Also at least four men must be present at the fire from the time it is lighted until it is thoroughly extinguished, to assist in keeping it under control, and to prevent it spreading to adjoining land. In the case of scrub burning, the fire must not be lighted before 9 o'clock in the morning. Although it is often impracticable to carry out the requirements of the Act, the person who wishes to

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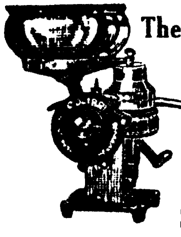

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burn should at all times use his discretion and common sense insofar as the safety of his own and his neighbor's property is concerned.'' Mr. White then illustrated his method of lighting up, with a carefully prepared plan. (Secretary, C. Altmann.)

THE AGRICULTURAL BUREAU.

Under the title, ''Has the Agricultural Bureau justified its Existence,'' the following paper was read by Mr. G. Chesney at the April meeting of the Overland Corner Branch:—

''It is a privilege to show that the Agricultural Bureau has justified its existence in this district. The future success or failure is entirely in the hands of members themselves. If every member does his part by regular attendance, and takes a lively interest in the subject of the evening, either by expressing his views or asking questions relative to the business before the meeting, there need be no cause for pessimism with regard to the future. The primary object of the Agricultural Bureau is to assist the men that produce the wealth of the country, whatever that occupation may be. Everyone will agree that the meetings held here for the last four years have been of very great benefit to every member that has taken an intelligent interest in the various matters brought forward for discussion. The remark has often been heard at the close of our meetings, 'Well, I learned something to-night,' which is an indication that the gathering had met with some measure of success. Because of the existence of a local Branch of the Agricultural Bureau, members receive the benefit of lectures on many different subjects dealing with primary production by specially trained officers of the Department of Agriculture. The advantage gained by these lectures alone justifies the existence of the local Branch of the Bureau. Apart altogether from the very interesting papers which are read and discussed by members, the Bureau as a medium for bringing men together in a social way to discuss their every-day problems has been a wonderful success. From an educational standpoint the Agricultural Bureau fills a long-felt want in our district. It takes the place of a literary society, and many men in public life to-day are indebted to the Agricultural Bureau for their first attempt at public speaking. The meetings held at Devlin's Pound are conducted in a manner that would do credit to any community by their orderliness and decorum. There is a marked improvement in the manner in which members address the chair, which proves that the Agricultural Bureau is of an educational nature. One has only to look back a few short years to the time when this Branch first opened; it was then quite difficult to get many members to stand up and express their opinions on any subject. Now it is not unusual for the chairman to use his authority to keep more than one from speaking at the same time. Every producer in the State should be a member of the Bureau and work together for the benefit of each other and when their interests are at stake to speak with one loud voice.'' (Secretary, H. Loffler.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Coomandook ..	31/3/33	7	Discussion	W. Trestrail
Boolgun	6/4/33	—	Question Box	G. Spencer
Marama	23/3/33	6	Paper from *Journal*	T. Hinkley
Yurgo	4/4/33	9	Address—H. Gepp	H. McKenzie
Parilla	4/4/33	6	Address—R. L. Griffiths .	C. Foale
Pinnaroo	7/4/33	13	Paper from *Journal*	H. Badman
Pinnaroo	21/4/33	150	Presentation Life Membership Certificate, F. S. Bonnin	H. Badman

SOUTH AND HILLS DISTRICT

BELVIDERE.

March 1st.—Present: 10 members.

Foodstuffs in Relation to Feeding.—Mr. A. Beviss, of the Strathalbyn High School, delivered an address in the course of which he traced the passage of a mouthful of food through the digestive organs of a cow, and said that the cow probably owed its ability to eat ravenously and masticate afterwards to its ancestors of many centuries ago, who, not being able to protect themselves from the ravages of the other wild animals of their time, were forced to bolt their food and then seek refuge; that may have been responsible for the cud. Two points raised by Mr. Beviss in the course of his address which should be of special interest to dairymen were: 1. Plenty of water should always be available, as a cow would make about 12 gallons of saliva in a day with which to masticate her food. 2. Feeding to keep a cow in good store condition, kept her in good health. If she became fat when fed for milk production and did not show an appreciable increase in her supply it could be decided that the animal would not pay for her keep. Mr. Eckert asked "What amount of starchy food is required to feed a horse?" *Reply*—About one double-handful of either crushed oats, barley, or wheat per feed. Mr. Eckert said that on a recent trip to the South-East he saw young horses being fed on clover, and exceptionally well grown for their age, and much superior to his own horses grazing in the stubbles. The question asked was, "Would clover be responsible for the difference in growth?" *Reply*—Clover would give better results than stubble, because it contained more protein. Mr. C. Ansell asked, "Which would be the better feed for cows; barley or oats?" *Reply*—Barley is a good milk producer, but to a greater extent lacks the qualities of oats in keeping a cow in good condition as well as increasing the milk supply." Mr. J. Collett asked, "Would crushed peas be suitable for feeding working horses?" *Reply*—It would be a waste of money to feed them to working horses, as they are high in protein; but for growing horses they would play an important part in the making of a well-developed horse. Mr. Eckert asked, "Why are turnips fed to cows?" *Reply*—Because they are very appetising and rich in sugar, and when young are nearly entirely digestible, and that would make them a good milk producer. (Secretary, M. Pearce.)

INMAN VALLEY.

LESSONS FROM 1932.—Paper read by Mr. W. Roads—"The chief lesson the man on the land should have learnt during 1932 was to cheapen production by the increase of returns from livestock off every available acre to counteract the low prices of all farm produce. The only way to do this is to keep the best class of livestock and feed them well with fodder produced on the farm and conserved when at its highest feeding value. After a wonderful season for feed there are hundreds of tons of valuable feed dried out and parched with very little nutriment left. The lesson to be learnt from this is quite plain when a few men in the district keep their cows and sheep in good order by feeding meadow hay, which means more butter and more wool from the same number of animals. Another lesson is that it is profitable to apply heavy dressings of super on pasture lands. The rabbit pest this year reached alarming numbers, and must be kept in check at all costs by the best means available. As men on the land, the past year should have proved the value of mixed farming. Do not get 'panicky,' but stick to the side lines that have been developed, as in the past; low prices for certain lines will after a time return to a profitable figure. Another important point learnt is to cut and stack one part of the meadow hay for ensilage and another at a more matured stage. The cows will milk as well at this stage as other years when fed on bran, and later on when green grass is available, it will be possible to change over to the more solid hay and thus save a heavy bran and chaff bill." (Secretary, H. Lewis.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Shoal Bay	4/4/33	11	Discussion	E. Bell, Wisanger
Belvidere	15/3/33	—	Annual Social	M. Pearce
Blackheath	23/3/33	6	Paper from *Journal*	E. Paech
Inman Valley ..	16/3/33	10	"Stock Ailments," W. Roads	H. Lewis
Cherry Gardens.	8/4/33	12	Visit to Mount Lofty	A. Stone
Springton	1/3/33	7	Discussion	E. Brokate
Springton	5/4/33	12	"Sheep on the Farm," W. Forrest	E. Brokate
Hope Forest ...	3/4/33	12	Lecture—E. W. Pritchard	E. Muldoon
Langhorne's Crk	4/4/33	10	Dairy Hygiene	P. H. Nurse
Hartley	5/4/33	18	Question Box and Debate	D. Harvey
Port Elliot	15/4/33	12	"Jersey Island," J. Crompton	J. Colebatch, Victor Harbor
Monarto South .	11/4/33	22	Address—R. Hill........	C. Altmann
Macclesfield ...	20/4/33	17	"Top Dressing," R. Scott	H. Ross
McLaren Flat ..	5/4/33	22	Address—W. M. Aird ...	P. Wait

CROWN LANDS.

LANDS TO BE OFFERED SHORTLY.

Lands to be offered in the Hundreds of ALLEN, BOWHILL, BRIGHT, ETTRICK, FISHER, HOLDER, KADINA, KEKWICK, MILNE, NOARLUNGA, PEEBINGA, POOGINOOK, and TICKERA.

When offered full particulars will be published in the *Government Gazette*, and plans and detail may be obtained on application to the Director of Lands, Box 293A, Adelaide.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

R. S. RICHARDS, Commissioner of Crown Lands.

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All communications to be addressed:
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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

Far North, at Morchard, Wednesday, July 19th. (Secretary, Mr. A. McCallum.)

Murray Lands (West), at Karoonda, Thursday, August 3rd. (Secretary, Mr. M. N. Blacket, Wynarka.)

Eyre's Peninsula (East), at Cowell, Thursday, August 10th. (Secretary, Mr. Guy E. Smith, Cowell.)

Southern, at Goolwa, Thursday, August 17th. (Secretary, Mr. D. Jeff Gordon, Currency Creek.)

Hills, at McLaren Flat, Thursday, August 24th. (Secretary, Mr. P. T. Wait.)

Murray Lands (East), at Taplan, Tuesday, September 26th. (Secretary, Mr. P. R. Hodge, Nangari.)

Pinnaroo Line, at Parilla, Thursday, September 28th. (Secretary, Mr. C. S. Foale.)

Eyre's Peninsula (Southern), at Cummins, Wednesday, October 4th. (Secretary, Mr. H. M. Roberts.)

Eyre's Peninsula (Central), at Minnipa, Friday, October 6th. (Secretary, Mr. D. V. Kitto.)

Each Conference will commence at 10.30 a.m.

Winter School for Farmers.

The winter school for farmers will be opened at Roseworthy College on the morning of Wednesday, August 2nd, and will end on the morning of Friday, August 11th. Branch Secretaries are reminded to bring this matter before their members in order that nominations may be forwarded to the Principal of the College at the earliest possible date.

Artificial Manure Subsidy.

Part VII. of the Commonwealth Relief Act, No. 64 of 1932, provides for the payment to *primary producers* throughout Australia of a subsidy of 15s. per complete ton of artificial manure used by such primary producers in the production of primary produce other than wheat during the year ending November 30th, 1933.

This means that, providing a primary producer has applied to the soil during the period 1/12/32 to 30/11/33, one ton of artificial manure in connection with the production of any primary product, *except wheat*, he will be eligible to claim 15s. subsidy. If he has used two tons during that period he will be eligible to receive 30s., and so on: but if he has used less than one ton no subsidy is payable as the Act prescribes that in calculating amounts of subsidy, fractions of a ton shall be excluded.

The financial assistance in regard to the use of artificial manure applies to primary producers in respect of every product except wheat. Special provisions has, of course, has been made for wheatgrowers under Commonwealth grants distributed by the States. Producers of oats, barley, hops, beans, apples, pears, citrus fruits, tobacco, etc., will therefore be eligible to claim the subsidy, which will also apply to artificial manure used in top-dressing of pastures.

Artificial manure for the purposes of the Act is any substance which contains nitrogen, phosphoric acid, or potash, and which has been manufactured, produced, or prepared in any manner for the purpose of fertilizing the soil or supplying nutriment to plants, but does not include any animal or vegetable matter which has not been subjected to process or manufacture.

Lime does not come within the meaning of artificial manure for the purposes of the Act.

Applications for the subsidy must be made *in ink* by primary producers on special forms which are obtainable at country post offices, and these applications will require to be completed by the primary producer and sent by him to the supplier of the artificial manure for his certificate as provided on the form. The supplier will then send the application to the Fertilizer Subsidy Section of the Department of Commerce in the State in which the fertilizer has been used. South Australian claims should be sent to the Secretary, Department of Commerce, care of Mr. S. Lillywhite, Box 376D, G.P.O., Adelaide.

Claims for the subsidy should not be lodged until the fertilizers have been actually applied to the soil, but it is not necessary to wait until the produce has been harvested. In order, however, to keep the cost of administration as low as possible, intending applicants should not lodge their claims until the total quantity of fertilizer which is required for the year has been used. One claim will then suffice to cover the whole quantity used except in cases where the fertilizer has been purchased from different firms, when one claim in respect to the total quantity purchased from each seller will be necessary.

The declaration to be completed by applicants for the subsidy as shown on the form of application, must be made in the presence of either a Commissioner for Declarations, a J.P., or Bank Manager, Post-master, Station-master, or Constable or Officer of Police. No other official is authorised to take this declaration.

Primary producers are requested to exercise every care in completing their claims so as to insure that they claim the subsidy only in respect of artificial manure *used* during the period 1/12/32 to 30/11/33. If the artificial manure was applied to the soil prior to 1/12/32, no subsidy is payable. It must also be used prior to 30/11/33 to be eligible for the subsidy. All the particulars asked for on the form of application must be filled in by the applicant, otherwise delay will be caused in finalising the claim owing to the necessity of returning claims to primary producers for completion or correction.

Canadian Wheat Crops.

The Secretary of the Department of Markets has forwarded the appended extracts from the March report of the Royal Bank of Canada dealing with Wheat Drying and Rust in Canadian wheat crops.

Wheat Drying.—In the three crop years, 1925-26-27, the amount of tough and damp wheat in the Canadian crop was estimated at 450,000,000bush. Complaints by purchasers that it had been damaged in the process of drying led to investigation, under the direction of the National Research Council, showing that damage to grain by artificial drying need not occur. Over a period of years, the improved methods discovered for the drying of wheat should be the means of saving millions of dollars. It is said that even in the past year there has been an improvement in the average grade of Canadian wheat as a result of this investigation.

Rust.—Under the leadership of the National Research Council the Departments of Agriculture and the research departments of the Universities of the Prairie Provinces have made a substantial contribution to the solution of the problem of cereal rust. The investigation of this problem represents the largest co-operative scientific effort made in this country. In some years wheat rust has cost Canada as much as 100,000,000bush. of grain. Over the past 15 years the cost has averaged at least 20,000,000 dollars a year, and in 1916 the wheat crop of North America was reduced as a result of rust by 280,000,000bush. Already, the Council is in a position to state that the solution of this problem is assured. Several of the new wheats under investigation appear to combine satisfactory baking qualities, high yield, and rapid growth with a power to resist rust. It is expected that wheats of these new varieties will be available on a commercial scale in 1934.

While the problems mentioned above have to do largely with wheat, there are also investigations under way with regard to plant disease, weeds, and yields which will be of material assistance to agriculture in other parts of the world. There is also a research programme under way in connection with the use of waste straw, the results of which should be of great interest to the prairie provinces.

Barley in Wheat Crops.

At a meeting of the Advisory Board of Agriculture in November last, attention was drawn to the prevalence of barley in wheat crops. Reports were subsequently obtained and it was stated that in the Southern district and in the Western side of Eyre's Peninsula the appearance of barley in wheat crops was not quite so bad as in the previous year; in the South-Eastern and the Murray Mallee districts the trouble did not appear to be greater than usual; in the Eastern side of Eyre's Peninsula it was slightly more prevalent. In the Lower North and Upper North districts, however, the reports indicated that it had become much more prevalent even to 100 per cent. in the latter district. During last season in the Lower North it was difficult to find a greater number of crops free from barley unless they were specially prepared for competition or were on farms on which barley was never grown.

Various causes for its prevalence and suggestions for its control have been given. The continued use of home-grown seed which has not been properly cleaned has been an important contributing factor. Oats, as a rule, are badly contaminated with barley, and the feeding of uncrushed grain results in much of the barley being distributed on the fallows. This also applies to the feeding of hay containing barley, especially during the autumn months. In fact the latter cause is considered by some to be of greater influence in spreading barley than any carelessness with seed wheat.

Argentine Wheat Exports.

The Argentine correspondent of the Empire Marketing Board has furnished a report, dated April 3rd, 1933, showing that during the month of March the quantity of wheat exported from the republic totalled 479,451 metric tons, practically the same as in the month of February, when 478,111 tons were shipped. In January, 375,124 tons were exported. The total shipped overseas during the first quarter of the year was therefore 1,332,686 tons. This is considerably below the figure for the corresponding period of last year, when 1,661,333 tons were exported.

The figures for the last week of March were particularly low; only 57,187 tons were exported as compared with 115,824 in the corresponding week of 1932. This small shipment is probably due in part to the very bad state of the roads in a great deal of the wheat areas, following heavy rains which were in some districts torrential and led to the washing out of bridges and flooding of low-lying lands, and in part to the market conditions, the low level of prices, making the country holders of wheat reluctant to dispose of more than is absolutely necessary.

The statistical position with regard to the wheat crop is now as follows:—

	Tons.
Second official estimate of the 1932-33 crop	6,405,993
Carry-over from 1931-32 crop	300,559
Total	6,706,552
Required for seed and domestic consumption	2,600,000
Balance available for export	4,106,552
Exported to March 31st	1,332,686
Still available for export	2,773,866

It will be seen from this statement, that practically one-third of the exportable surplus of the crop has moved out during the first three months of the year.

Australian Grapes in Canada.

The Australian Trade Commissioner in Canada has forwarded a report to the Department of Commerce on a shipment of 3,000 boxes of grapes which arrived at Vancouver by the s.s. *Niagara* on April 22nd, 1932. The grapes were packed in the usual manner, in boxes containing 25lb. each, and the variety was "Ohanez," more familiarly known

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on this market as "Almeria," or at least regarded as being the same variety. The grapes arrived in good order, and were favorably commented on. One case was sent to the Prime Minister, who shared it with Lord Ashfield, and both were favorably impressed with the condition of the grapes after such a long journey. The sales in Eastern Canada were handicapped to some extent by reason of the presence on the market at the time of their arrival of considerable quantities of Argentina grapes shipped in from New York at fair values (from $2.75 to $3.25 per box of 10lb. at Toronto and Montreal). Argentina grapes were brought in from New York by rail, the price at the latter city having been reported to be $1.80 in April and early May last. The quality and flavor of the Argentina grapes was inferior to our own. Our Almerias were generally regarded as superior. The only point made was that the bunches were rather smaller than that of the competing article. The Argentina grapes are usually over by the end of April, but this year the Argentina season was somewhat prolonged. The packing was not as good as ours; the Argentina boxes were 10lb., and the grapes were loosely packed without any cork-dust. The *Niagara* shipment of Australian grapes was purchased by the Eastern trade at around $4.75 Toronto, and they were selling in the retail stores at approximately 30 cents per lb.

Unquestionably there was a market for our grapes in this country during April and May. The question of the extent of the market available was, to a considerable extent, determinable by the price at which the goods could be sold. Obviously a retail price of 30 cents per pound was rather on the high side to secure a large volume of consumer demand, as it placed the goods immeasurably in the luxury class. Existing transport conditions were a handicap in approach to Eastern Canada by reason of the long period during which the grapes would be in transit; usually the journey from Eastern Australian ports to Montreal took about eight weeks under present conditions. A shipment of grapes was made by Canadian National steamer to Montreal, which arrived on June 30th. There were 500 cases in this shipment, which, unfortunately, was not a success. A few cases were sold at $6.00, but the bulk of the shipment was quoted as low as 30 cents per case. The trade were interested in the shipment, but the majority of the fruit was largely in wasty condition on arrival. A substantial loss was sustained by the shipper. The fruit was consigned from Melbourne. The cost of shipping grapes from Vancouver to Eastern Canada was $1.00 per 25lb. box. It would appear to be preferable to incur this charge rather than to run the risk of shipment *via* Montreal under present transport conditions.

Farm Butter.

Replying to a correspondent who states that butter develops a stale and rancid flavor two days after making, Mr. H. J. Apps (Senior Dairy Instructor) gives his opinion that the cream is not churned frequently enough, and that cream is ready when about 48 hours old and not exceeding three days. Mr. Apps adds that the following instructions, if carried out, may assist in overcoming the difficulty:—Stir the Cream two or three times daily; churn when the cream is 48 hours old, or not longer than 72 hours; separator cream to test 35 per cent. to 40 per cent. in winter and 40 per cent. to 45 per cent. in summer; thoroughly scald the churn, and then cool off with cold water; should the cream be very thick, break down the consistency with cold water; churn at a temperature of 52deg. to 54deg. F. in summer and 56deg. to 58deg. in winter; make sure that the cream is receiving plenty of concussion during the churning operation; add a little water just after the cream has broken to wash down the lid when the grains are about the size of hemp seed; continue churning until the grains of butter reach the size (short) of raw rice; drain off the butter milk; add water 2° F. lower than churning temperature, sufficient to float the butter; churn again until the grains reach the size (short) of boiled rice; run off the wash water—if not clear give another washing; add salt at the rate of 3lbs. to 3½lbs. per 100lbs. of butter; work well, but do not overwork to cause the butter to become greasy; observe absolute cleanliness at every stage from milking until the product is manufactured.

Japanese Plums for Export.

In reply to a question asked by a correspondent in Victoria, Mr. R. Fowler (Manager Blackwood Experiment Orchard) stated recently that Japanese plums had not been extensively shipped from South Australia to London, but in 1922 an experimental consignment of plums was forwarded per the *Moreton Bay* in February, and included in the parcel was a number of Japanese plums. October Purple seems to have been the best variety. It is a good bearer; a strong growing, vigorous tree, and a clingstone. It is in bloom early in September and ripens at Blackwood towards the end of January.

Mr. Fowler is of the opinion that the best varieties of Japanese plums are—

Santa Rosa, ripening end of December—partial clingstone.
Formosa, ripening end of December—clingstone.
Climax, ripening early January—partial clingstone.
October Purple, ripening end January—clingstone.
Shipper, ripening end January—clingstone.
Wickson, ripening early February—clingstone.
Narabeen, ripening late February—promising late plum.
Wright's Late, ripening mid-February—clingstone.
Satsuma, ripening mid-January—clingstone.
Kelsey, ripening mid-February—clingstone.

Narabeen has only recently been introduced into the Blackwood collection, and it fruited for the first time this season. It bore only a few fruits, but that is no indication of what it may do when fully grown. It is reported from New South Wales as a good cropper. It ripened at Blackwood on about February 20th, although it is listed by Rosen (New South Wales) as ripening in mid-January. *Santa Rosa* ripens at the end of December, and *Shipper* at the end of January. The former is rather too early for a shipping plum. *Wright's Late,* which ripens about February 20, is later than either Santa Rosa or Shipper. It is fine quality blood plum, clingstone, heavy cropper, and should carry well. *Santa Rosa, Formosa,* and *October Purple* are excellent fruits, and would make good export varieties if shipping space were available at the time of ripening.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publication:—"The Veterinary Journal," April, 1933. This issue is devoted to the breeding and diseases of dairy cattle. Published by Baillière, Tindall and Cox, London. Price 2s. 2d., post free.

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VETERINARY INQUIRIES.

[*Replies Supplied by Veterinary Officers of the Stock and Brands Department.*]

"Morchard" reports (1) horse with swelling under jaw, discharging; (2) gelding with cough and discharge from nose.

Reply—(1) Make a careful examination of the horse's mouth for grass seeds (especially under tongue and at sides of the teeth) or for a loose or decayed tooth. If present, they should be removed. Clip hair over and around swelling under the jew, wash, dry, and for 10 minutes rub in a biniodide of mercury (1-10) blister. Next day wash off and apply vaseline. If the swelling breaks, syringe out with tr. iodine three times daily.

(2) Give one tablespoonful of Fowler's solution of arsenic in a small damped feed night and morning for 21 days. The chaff should be damped before feeding, and not too much given at one feed. If the animal is a greedy feeder, give long hay before chaff feed.

"Coomandook" reports lambs in weak condition. P.M. *shows lungs dry and inflamed, also worms in intestines.*

Reply—The trouble in the lambs is probably "parasites." Drench them with bluestone solution made up as follows:—Dissolve 8ozs. of bluestone (fresh hard blue crystals only) in 3galls. of water. Break up the lumps and first dissolve in a little boiling water, then add cold water to make up to 3galls. of solution. Use an enamel bucket. The doses are:—Adult sheep, 2ozs.; two tooths, 1½ozs.; lambs (6-12 months), 1oz.; lambs (3-6 months), ½oz. The lambs should be yarded 3 p.m. in the afternoon, drenched next morning at 10 a.m., and kept yarded until 2 p.m., when they can be released. No feed or water should be given whilst yarded either before or after drenching. They should be drenched every four weeks, and in the event of definite improvement it will be advisable to drench all sheep on the farm. The affected sheep should be hand fed on crushed oats (¾lb. daily).

"Echunga" has cow on fifth calf, did not clean properly, udder badly swollen. The same happened in next calving, but cow did not clean at all. The afterbirth had to be removed.

Reply—It is extremely likely that the animal will have a recurrence of the mammitis again after she calves. Give her a laxative drench of Epsom salts 1lb., molasses ½lb., ground ginger 2 tablespoonsful, warm water 1 quart two or three days before the due date of calving. If the udder becomes swollen beforehand, massage gently, and, if necessary, just milk her sufficiently to ease her, but do not strip right out. If, after calving, the mammitis recurs, apply hot foments at frequent intervals, followed by massage and strip affected quarters right out every two or three hours, persisting in this treatment until the milk clears up. There is no medicine you can give that will have the special effect of removing retained afterbirth. If this cannot be properly removed by hand, then douche out the passage daily with one or more gallons of very weak warm Condy's solution until the membranes become detached.

"Ceduna" has gelding weak in legs, difficulty in rising, small swelling between front legs.

Reply—Starve the animal for 16 hours and then drench with 1½ pints raw linseed oil, 4 tablespoonsful turpentine. Subsequently provide animal with nourishing food and give 1 tablespoonful of Fowler's solution of arsenic in damped feed night and morning for a fortnight. If opportunity offers, have the animal's teeth examined and any necessary dental attention given. The swelling between the front legs is due to the debilitated condition of the animal, and will gradually disappear as he picks up. Its absorption can be hastened by massage.

"Hartley" asks what percentage of soda should be mixed with strychnine to make it more effective.

Reply—The Director of Chemistry advises that soda should not be used, as its admixture with the strychnine would render the latter unsoluble. He advises that 1oz. of strychnine can be dissolved in 16 fluid ounces (1 fluid ounce equals 2 tablespoons) of vinegar.

Black Rock Agricultural Bureau reports—1. Ringworm in cattle. 2. Cattle eating fowl manure. 3. Horse continually yawning. 4. Calf unable to see after sundown.

Replies—1. Warts in cattle are frequently mistaken for ringworm. Treat the condition described as follows:—(1) Isolate affected cattle—the condition is contagious. (2) Swab daily with warm castor oil. (3) Later remove scabs (burn) and subsequently dress with tinct. iodine.

2. The depraved appetite is probably due to mineral deficiency. Try giving the following lick:—Superphosphate, 2 parts; coarse salt, 1 part. It can be put out in a trough for dry and young stock. For milking cows 4 tablespoonsful can be put in the feed three times weekly. Feed your affected cows a ration of crushed oats and bran.

3. There may be a diseased tooth or foreign body in the mouth causing this action. Make a careful examination of the mouth.

4. A condition of the eye is occasionally seen in young calves in which the eyes show a bottle green appearance. There is total or partial loss of sight, but otherwise the eyes appear normal. The condition is incurable. It is due to a want of green feed (lucerne) during the summer.

Clanfield Agricultural Bureau asks treatment for blood worms in horses.

Reply—The most satisfactory way to treat horses for blood worms is to starve for 16-24 hours. Then give a drench of raw linseed oil 1½ pints, turpentine 4 tablespoonsful. Subsequently give 1 tablespoonful of Fowler's solution of arsenate in damped feed night and morning for a fortnight; discontinue it for a fortnight, and then repeat its administration for another fortnight.

Wasleys Agricultural Bureau asks cure for white scours in calves.

Reply—Give at outset a dose of 2ozs. to 4ozs. of castor oil. Subsequently give a drench of 1 tablespoonful of lysol in 1 pint of cold water, and, if necessary, repeat in 48 hours' time. If this treatment does not prove effective, have some powders made up each containing pulv. opii, 5 grains; pulv. catechu, 2 drams; creta prep., ½oz. Give one powder night and morning in flour gruel.

Hope Valley Agricultural Bureau reports heifer on first calf with two hard lumps between the back quarters.

Reply—The lumps may be a normal condition. Heifers frequently show hardness of the udder about calving time, and this hardness frequently persists for some time after calving. Watch the heifer, and if the lumps are still present in three to four weeks' time write again for advice.

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"Narridy" reports foal lame for eight weeks on off front leg, no swelling visible.

Reply—From the symptoms, as described, there is little doubt that the foal has been injured in the region of the point of the shoulder. The animal should not be allowed to gallop and jump about with the other foals, as this would undoubtedly aggravate the trouble, and, in fact, it is quite likely that this behavior was responsible for the injury in the first instance. If the foal is kept quiet it should gradually recover. The muscles in the area of the point of the shoulder could, with advantage, be well massaged daily, rubbing in some embrocation.

Belvidere Agricultural Bureau reports death of mare through blood worms, and asks if her foal is likely to be troubled with these worms.

Reply—It is doubtful if the foal will have as yet become infested with worms to any great extent, but once the green feed comes along it is more than likely that the animal will become so through grazing over the pastures which will have been contaminated by the manure of affected horses.

Penola Agricultural Bureau reports mare which appears to have been injured across the loins.

Reply—The filly undoubtedly appears to have sustained an injury of some kind, but without the assistance of a personal examination of her, it is impossible to diagnose the exact nature of the injury. Nor is it possible to express any definite opinion as to her chances of ultimate complete recovery. From the history of the case there appears to be quite a good chance of recovery. She should be kept under conditions where she can get rest and quiet exercise, and if she would be contented in a paddock by herself it would be best to separate her off from other horses. 1 teaspoonful doses of powdered nux vomica could be given night and morning (mixed in a little molasses or honey and placed on the back of tongue) for a week, and subsequently repeated every alternate week. *Re* feeding, allow her to obtain plenty of green feed (if available), supplemented, if necessary, by small daily amounts of bran and chaff. If available green feed is limited in quantity, then give more liberal allowances of bran and chaff well damped. A small daily allowance of barley could also be given, but it should be either crushed or soaked.

"Kyancutta" reports mare which is difficult to get in foal.

Reply—Without an opportunity of examining the mare it is impossible to say what the trouble is. Next time the mare is "in season," half an hour before putting her to the horse, introduce the hand into the breeding passage and examine to see that the narrow passage leading from the vagina to the uterus (or breeding bag) is properly dilated, and if not, try to dilate it gradually by insertion of the fingers. (When properly dilated this canal or passage should admit of the insertion of two or more fingers). Having ascertained that this passage is properly dilated, rake out from the vagina as much of the mucous secretion as possible. Then finally douche out with a luke-warm solution of baking soda (strength, 1 tablespoonful to the pint of water).

"Wirrelyerna" has cow badly bloated and unable to rise.

Reply—(1) Give the cow the following drench:—Raw linseed oil, 1½ pints; aromatic spirits of ammonia, 1oz. (2) Subsequently give 1 teaspoonful of powdered nux vomica night and morning for 14 days. To give, mix with treacle and smear on the tongue. (3) Change cow from side to side occasionally during the day if she cannot do this herself. Feed on good nourishing food, but not heavy, and, if possible, give green feed. The cow may stay down for a week or more.

Boors Plains Agricultural Bureau reports pigs five months old, rash on skin and losing condition.

Reply—Dress the pigs with skin lesions with sulphur and raw linseed oil. Add sufficient sulphur to make a thin dressing. As regards feeding—if skim milk is available, give daily. If only barley is provided, allow pigs out for a portion of the day to get what grazing is available. It is also suggested that 3lbs. of the following mixture be given in every 100lbs. of grain:—Salt, 4lbs.; ground limestone, 16lbs.; iron oxide, 1lb.

Royal Spring Show

1933.

SEPTEMBER 9-16

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Entries Close Friday, June 30,

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HAROLD J. FINNIS, SECRETARY.

''Kimba'' has cow, loss of appetite, dry cough, and breathes heavily.

Reply—Give the cow the following drench:—Epsom salts, 1½lbs.; ginger, 4 tablespoons; treacle, 1 cupful; warm water, 2 pints. Subsequently give 1 teaspoonful powdered nux vomica night and morning for 14 days. To give mix with treacle and smear on the tongue. If the cough persists and the breathing remains heavy, it is strongly advise that she be slaughtered.

''Comaum'' reports horse off feed, and soft swelling in the stomach above sheath.

Reply—If the horse is no better, give him the following drench:—Raw linseed oil, 1 part; oil of turpentine, 4 tablespoonsful. Subsequently give 1 teaspoonful of powdered nux vomica night and morning for 14 days. To give, mix with treacle and smear on the tongue. Do not work. Give a light ration and plenty of green feed.

''Wasleys'' asks remedy for foal with worms.

Reply—Starve the animal for 16 hours, and then give the following drench:—Raw linseed oil, ½ pint; turpentine, 1 tablespoonful.

''Mount Bryan'' reports bull with sores on the body.

Reply—The condition is probably warts. It is suggested that you swab the scabs for four to five days with a mixture of sulphur and raw linseed oil made to a thin gruel-like consistency. Subsequently remove the scabs (collect and burn them) and paint affected areas for a few days with tr. iodine.

Miltalie Agricultural Bureau asks treatment for pigs infested with lice.

Reply—The so-called ''tick'' is really the pig louse. If the lice are numerous, make up the following preparation:—Petrol, 2ozs.; kerosene, 2ozs.; raw linseed oil, 1 pint. Apply with a brush. To control lice, periodically brush crank case oil along the back. Further, clean up your sties, and, if practicable, move your pigs to fresh temporary quarters whilst you are cleaning the sties.

''Streaky Bay'' reports horses stiff in limbs; have been stable fed for nearly eight months.

Reply—The condition in the horses is laminitis, or founder (mild type). It is possible that you are overfeeding, especially on grain. Note that too much feeding on an early green crop of barley, oats, &c., may cause the same condition. Prevention consists in reducing the grain ration so that condition of the horses is lowered. Affected animals should be treated as advised in the attached pamphlet.

''Mannum'' asks if an earmark and brand must be put on stock.

Reply—A cattle earmark must be registered, and an earmark is only allotted to the owner of a registered horse and cattle brand. Sheep earmarks are not registered, but the owner of a registered sheep brand may use any earmark he desires, subject to the rules of branding. It is not necessary to use both brand and earmark on stock. In the case of cattle, ownership may be established by either the brand or earmark, but in the case of sheep the brand should be used. Sheep earmarks—although not registered—may materially assist in establishing ownership.

PLANTING ALMOND TREES IN BLOCKS.

Mannum asks if it is advisable to plant as many as 130 almond trees in one block. Mr. G. Quinn (Chief Horticultural Instructor), to whom this question was referred, says that one of the principal causes why almond trees have not been a success when planted in orchard blocks can be attributed to the trees having been crowded too closely together. If planted 22ft.-24ft. apart in squares they will thrive, providing there is sufficient moisture maintained in the land. Almond trees grown in this way need pruning to shape them when young and thinning out old worn-out twigs every two or three years after they reach maturity and are cropping freely.

SHRIVELLED WHEAT AS A FOODSTUFF.

[By W. J. SPAFFORD, Deputy Director of Agriculture.]

Occasionally a season is experienced when many of the wheat crops of the State produce shrivelled grain of poor quality from a flour-making point of view, and because of its low weight per bushel and unattractive appearance, many livestock husbandmen consider this grain to be also of poor feeding value for farm livestock. Because of its universal use as a human food, wheat is always judged on its flour-producing qualities, and it is natural to look askance at a sample which is only fairly suitable for this purpose. From the point of view of a livestock foodstuff, however, a reduction in the flour content of grain may prove an advantage due to a corresponding increase in the protein content, and provided it is clean and free from the seeds of bad weeds its unattractive appearance goes for nothing.

At harvest time of the season 1932-1933 it was found that owing to the ravages of *Red Rust* and *Take-all,* there were many samples of wheat of very low bushel weight, and so rather unsuitable for flour millers' requirements, and the opportunity was taken to have some of these samples analysed to show their feeding value for farm livestock. To get a correct comparison between shrivelled and plump grain an attempt was made to secure good and poor samples of the same variety from the same farm, or failing this, from similar soils in the same district, and some success was achieved in this direction. In the following table are set out the anaylses of several samples of wheat harvested in 1932-1933, and consist of:—

All samples were taken directly from the harvesting machine without further cleaning or grading.

The two samples of Ranee from Saddleworth were grown on the one farm.

The two samples of Waratah from Saddleworth were grown on the one farm.

The two samples of Felix from Bowhill were grown on similar soil types but on different farms.

The samples of Ranee and Carmichael's Eclipse from Telowie, which were from badly rusted crops, were grown on the same farm, but samples of the same varieties with heavy weight per bushel and grown in the same locality, were not available for comparative purposes.

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ANALYSES OF WHEATS FROM 1932-1933 HARVEST.

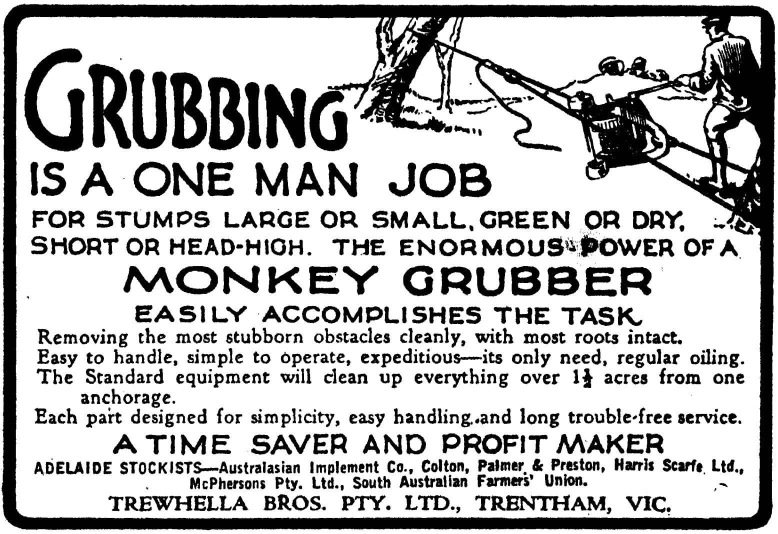
	Weight per Bushel.	Composition.						Digestible Nutrients.				Starch Equivalent.	Nutrient Ratio.
		Water.	Ash.	Crude Protein.	Fat.	Nitrogen-free Extracts.	Fibre.	Crude Protein.	Fat.	Nitrogen-free Extracts.	Fibre.		
	Lbs.	%	%	%	%	%	%	%	%	%	%	%	
Saddleworth—													
Plump—													
Ranee	64	9·0	1·7	8·0	1·8	76·9	2·6	6·7	1·1	70·7	1·2	76·5	1 to 11·1
Waratah	63½	9·0	1·7	8·7	1·8	76·4	2·4	7·2	1·1	70·3	1·1	76·5	1 to 10·3
Means	63¾	9·0	1·7	8·3	1·8	76·7	2·5	7·0	1·1	70·5	1·1	76·5	1 to 10·7
Saddleworth—													
Shrivelled—													
Ranee	53¼	9·0	1·6	9·0	1·7	75·5	3·2	7·9	1·1	68·0	1·6	73·0	1 to 9·1
Waratah	48½	9·0	1·6	10·3	1·9	74·3	2·9	9·1	1·2	66·8	1·5	73·0	1 to 7·8
Means	50½	9·0	1·6	9·7	1·8	74·9	3·0	8·6	1·2	67·4	1·5	73·0	1 to 8·4
Bowhill—													
Felix—Plump	63	9·0	1·5	8·9	1·9	76·1	2·6	7·5	1·2	70·0	1·2	76·8	1 to 9·8
Felix—Shrivelled	52	9·0	1·8	9·9	2·1	73·8	3·4	8·7	1·3	66·4	1·7	72·7	1 to 8·2
Telowie—													
Ranee—Shrivelled	46½	9·0	1·9	9·6	1·9	74·3	3·6	8·4	1·2	66·9	1·8	72·8	1 to 8·5
Carmichael's Eclipse—Shrivelled	45¼	9·0	2·3	8·3	2·2	74·5	3·7	7·3	1·4	67·0	1·9	72·4	1 to 9·9
Means (Saddleworth & Bowhill)—													
Plump (3)	63½	9·0	1·6	8·6	1·8	76·5	2·5	7·1	1·1	70·3	1·2	76·6	1 to 10·4
Shrivelled (3)	51¼	9·0	1·7	9·7	1·9	74·5	3·2	8·6	1·2	67·1	1·6	72·9	1 to 8·4

NOTE.—Analyses by Department of Chemistry of South Australia.

The figures in the above table show a very interesting comparison between the feeding values of plump and shrivelled wheat. At Saddleworth the means of the two varieties disclose an increase of 1.4 per cent. in the *Crude protein* content of the shrivelled grain, a reduction of 1.8 per cent. in the *Nitrogen-free extracts,* and an increase of 0.5 per cent. of *Fibre.* The *Starch equivalent, i.e,.* that calculation which gives a strict comparison of the fattening qualities of foodstuffs of the same kind, is higher by 3.5 per cent. for plump wheat as against shrivelled grain, but on the other hand, the *nutrient ratio,* which gives a good idea of the power of the foodstuff, (*a*) to encourage the production of milk, eggs, muscle, wool, &c., and (*b*) to help in the development of youngsters, is a good deal narrower for shrivelled than for plump grain. The samples from Bowhill gave somewhat similar results, the shrivelled wheat being 1 per cent. higher in *crude protein,* 2.3 per cent. lower in *nitrogen-free extracts,* 0.8 per cent. greater in *fibre,* 4.1 per cent. lower in *starch equivalent,* but with a *nutrient ratio* of 1 to 8.2, as against 1 to 9.8 for plump wheat.

The means for the three samples of plump and three samples of shrivelled grain from Saddleworth and Bowhill as analysed show that shrivelled grain contains about 1 per cent. more *crude protein* than does plump grain, 2 per cent. less *nitrogen-free extracts,* about ¾ per cent. more *fibre,* about 3¾ per cent. less *starch equivalent,* but the *nutrient ratio* is narrowed from 1 to 10.4 for plump grain to 1 to 8.4 for shrivelled grain.

On the figures resulting from the analyses of wheat from the 1932-33 harvest it can be confidently asserted that shrivelled wheat, free from seeds of bad weeds, remains a first class foodstuff for livestock. This pinched grain should prove superior to full-sized, plump grain for cows producing milk, for ewes rearing lambs, for growing pigs, and for laying hens, but if wheat is to be used for any of the farm livestock for fattening the animals or for maintaining them in condition, plump grain should prove superior. The weight per bushel of a given sample of wheat is a fair indication of the amount of flour it will yield, but it is no criterion of its nutritive value if to be fed as grain or whole meal, and thin, shrivelled grain is usually at least equal to plump grain as a livestock foodstuff.



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PEA HUSKS AS A LIVESTOCK FOODSTUFF.

[By W. J. Spafford, Deputy Director of Agriculture.]

From time to time somewhat unusual forms of livestock foodstuffs are submitted to the Department of Agriculture for an expression of opinion as to their feeding value for farm animals, and as the skins taken from Field Peas and Peanut Kernels create fairly considerable interest in this connection the analyses of these substances have been determined by the Department of Chemistry, and are here shown in comparison with some of the foodstuffs used by local livestock husbandmen:—

Analyses of Some South Australian Foodstuffs.

	Composition.						Digestible Nutrients.					
	Water.	Ash.	Crude Protein.	Fat.	Nitrogen-free Extracts.	Fibre.	Crude Protein.	Fat.	Nitrogen-free Extracts.	Fibre.	Starch equivalent.	Nutrient Ratio.
	%	%	%	%	%	%	%	%	%	%	%	
Pea Husks (Early Dun)	10·0	3·1	9·4	0·6	46·0	30·9	4·7	0·2	27·6	13·9	37·3	1 to 8·9
Pea Husks (White Brunswick)	10·0	3·3	9·2	0·8	45·7	31·0	4·6	0·3	27·4	13·9	37·2	1 to 9·1
Peanut Kernel Skins ...	10·0	2·3	11·5	16·6	45·8	13·8	6·7	6·9	27·5	6·2	49·2	1 to 7·4
Oat Husks	10·0	5·7	2·0	0·5	47·9	33·9	0·5	0·2	17·2	11·2	19·4	1 to 57·7
Wheat Husks (Cocky Chaff)	10·0	10·8	5·0	1·8	39·8	32·6	1·3	0·8	13·1	12·7	18·9	1 to 21·2
Wheaten hay	10·0	6·2	5·1	0·8	53·5	24·4	2·8	0·5	33·7	7·9	31·0	1 to 15·2
Lucerne hay...........	10·0	9·0	14·6	1·7	37·7	27·0	11·1	0·8	25·6	11·3	33·2	1 to 3·5

These figures show that the Husks of Field Peas with a *Starch Equivalence* of 37.2 per cent. are of a little better fattening value than Wheaten Hay Chaff with a *Starch Equivalence* of 31.0 per cent., and as their *Nutrient Ratio* is 1 to 9, they should prove to be a good deal better as a milk-producing foodstuff than Wheaten Hay with a *Nutrient Ratio* of 1 to 15.2. In comparing these Pea Husks with Lucerne Hay Chaff it can be seen that they are approximately equal for fattening purposes, but that the narrow *Nutrient Ratio* of the Lucerne, viz., 1 to 3.5, shows this substance to be much the better milk-producing foodstuff.

The Skins of Peanut Kernels are shown to be a really good livestock foodstuff, having the relatively high *Starch Equivalence* of 49.2 per cent. and a *Nutrient Ratio* of 1 to 7.4.

A REVIEW OF SOME OF THE CRUCIFEROUS WEEDS OCCURRING IN SOUTH AUSTRALIA, WITH PARTICULAR REFERENCE TO THE LOWER NORTH.

[By WORSLEY C. JOHNSTON, R.D.A., Agricultural Instructor.]

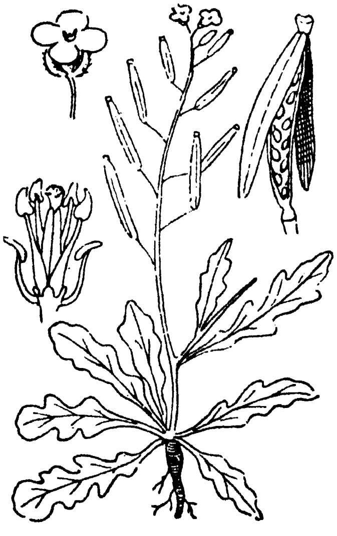
(Continued from page 1173.)

Diplotaxis muralis. *Sand Rocket.*

(Known variously as Stinking Billy, Goat Weed, Nanny Weed, Wurm Weed, Monkey Weed, and Summer Weed.)

Description.—An annual—although a perennial variety does occur—slightly hairy, with very few stem leaves; resembles the preceding species, although the flowers are not so brightly colored and the seed pods are similar but are borne on shorter stems; seeds fine, brownish-yellow, carried on each side of the central partition. This plant has the same objectionable odor as Lincoln Weed, as would be suggested by its vernacular names.

It flowers, generally, in the spring, although some plants may be found in that state at almost any time of the year.



Diplotaxis muralis. (L.) D.C.
(Sand Rocket.)

Origin.—A European plant which has become widely distributed throughout the temperate parts of the world.

Localities where Found.—It is found almost throughout the State, but more particularly in those districts nearer oceanic influence.

Its Agricultural Importance.—A very free seeding weed, of which specimens can be found at almost any time of the year in a vegetative state. As an agricultural weed it causes great losses if not controlled, mainly by robbing the soil of elaborated plant foods and by competition with crops. It causes inconvenience and possible loss by enforcing frequent cultivations to keep it in check.

As a cropping weed it does not offer serious difficulty where fallows are kept in order, and it offers very little difficulty in the harvesting of any cereal in which it is growing.

Its chief disadvantage lies in the frequency with which seedlings will start on fallows, often no rain being necessary, and as it germinates best under warmer conditions it necessitates dry summer working of the soil, a procedure not relished by farmers. In practice, however, there is less to be feared from such working than there is from the weed, provided the working is not done deeply.

Stock are reputed to feed on this plant at times, but it would appear that it is only fed when no other greenfeed is available. Under ordinary pasture conditions, its unpleasant odor protects it from stock. On fallow, in the summer, sheep will pick it and keep it in control if not too thick. It taints meat and milk, and therefore animals used for the production of these products should be allowed access to the plant with care.

Control.—Its control lies in frequent and adequate working of the soil with wide cutting shares, or under conditions where practicable with the use of a plate or melon cutter. It is most difficult to control on light sandy soils where a risk of drift is likely to occur, and under these conditions it may be necessary to resort to hand work, cutting or pulling. If care and intelligence are used in the preparation of the land this weed is easily dealt with, and there is no reason to allow it to become a serious competitor with cereals, nor to allow it to rob the fallows of elaborated plant foods.

In cereal grain the seed is sufficiently fine to grade out, and there is little or no risk of introducing it to clean land if this operation is carried out.

Soils Favored.—The plant is of wide-spread distribution and can be found on almost all classes of land, but it shows a preference for coastal influence, being particularly on Yorke Peninsula. Further, in such districts the plant shows a liking for loose, well aerated soils of a calcareous nature, and many coastal lands grow it to profusion.

In years of summer rainfall the weed is apt to become a considerable nuisance on all fallows but more particularly those nearer the coast.

Lepidium Draba. *Hoary Cress.*

(Known variously as Chalk Weed, White Weed, Cabbage Weed.)

Description.—A very deep rooted perennial, reaching a height of 18in. or more; the base leaves are about 3in. long by an inch or so broad, stalked, wavy, with slightly toothed margins; those of the stem are stalkless and clasp the stem; flowers are white, very small, and are arranged on short stalks in such a way as to give a dense and almost flat-topped mass; pods are numerous, minute, and rarely more than ¼in. long, of an inverted heart-shape, the tips being slightly produced; one seed should be on each side of the central partition, but generally one of them aborts; the whole plant is covered with a dense felt of fine hairs, short and greyish, thus giving it a hoary appearance. Flowering occurs in the early spring and summer.

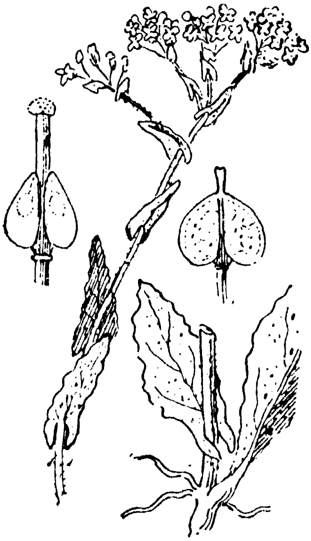
Origin.—This species is of European origin, but has become established in Western Asia and in most of the temperate parts of the world.

Distribution.—It is found in a great many districts in South Australia, and appears to be spreading rapidly. It is known to the writer from Giles Corner, Riverton, Roseworthy, the Moppa, Kapunda, Clare, Booborowie, Mintaro, and Hamilton in the lower north district and it seems to be established equally well in other parts of the State.

Its Agricultural Importance.—Its deep rooting habit coupled with the ability for sections of the root if shifted to establish new plants makes it a weed extremely difficult to control and more difficult to eradicate. Morgan[5] has shown that flowers are not produced until after the second season from seed germination, or in other words, until after there has been a very well-established rooting system. This fact makes the early recognition of the plant almost an impossibility under practical conditions, so that when first it is realised that the plant is on a farm it is well established and eradication is then difficult.

When once well established the plant competes with both pasture and crop, reducing yields very considerably, although in pasture it does less damage, particularly if the pasture is on heavy soil likely to pack down tight. In fields subjected to a three or four course rotation the weed becomes very much more vigorous, and will ruin the returns from either crop or pasture. It is reported by some farmers that sheep will feed it well, but investigation almost invariably shows that the sheep ingests it together with large quantities of other herbage.

Under cropping conditions there is a very grave risk of carrying the roots from field to field and so establishing new areas of infection. While this risk is slight during the summer, every possible precaution should be taken during the cooler months and particularly so during the winter.



Lepidium Draba. (L.) (Hoary Cress.)

The greatest importance of this weed is its competition for plant foods with any type of crop we may contemplate producing, and when well established by perennial roots which quickly throw forth vegetative shoots, it has a very serious advantage over any other crop, added to which is its almost complete uselessness.

Pammel[2] suggests that an extract has been made from this plant for the poisoning of fish—no doubt by primitive people—but this feature is one which we can well do without.

Control.—It has already been pointed out that this objective can only be achieved after much labor. Morgan[5] in an extensive series of control experiments with sprays and cultivation methods, has achieved much useful data with comparatively little success. The use of chemical sprays does not appear to offer sufficient encouragement to be continued with, the greatest success being gained with the use of arsenic pentoxide, but the use of this chemical by reason of its poisonous properties to animal life is beset with danger.

In experiments conducted in this State with the use of sodium chlorate, a considerable amount of success has been achieved; but it is necessary to alter the usual procedure advocated. It is customary to spray plants with this chemical when they are in flower, but a much earlier spraying, *i.e.*, before the plant has developed any woody or very fibrous stem, has given very much greater efficiency in South Australia.

This method, although costly, may be of value in controlling small areas of the plant before it has time to become thoroughly established.

The cultivation experiments conducted by Morgan[5] show that definite eradication can be achieved by cultivating the plot once every fortnight for at least two years, being sure that every growing shoot is cut. This method, though laborious, is most effective, and at least in small patches is well worth carrying out. This end could be achieved, in situations where practicable, by turning the area infested into either a fowl run or pig yard.

In large areas this means of eradication can be executed with difficulty, so that under such conditions it is generally preferred to attempt to reduce the vigor of the plant sufficiently to allow cereal crops to be grown. This is achieved in some small measure by relatively deep ploughing late in the season, allowing the land to remain rough through the summer and thus drying out many of the roots. Under such procedure every effort is concentrated on establishing a satisfactory seedbed by autumn workings, it being realised that if necessary the field must be sown late with an early variety of cereal. Under such a system of working satisfactory crops are being grown in the Lower North District.

It must be realised, of course, that such methods are only used with full knowledge that the weed will again develop and that occasionally the cereals will be smothered, but it offers a chance for the economic production of cereal crops.

Soil Favored.—In a wide range of localities this plant is found on many types of soil in which it is growing in profusion, but it exhibits a preference for soils fairly heavily charged with lime. This feature appears to be known in the Old World where the plant is known as Chalk Weed. While this is so the plant is found on almost all types of soil in the better rainfall parts of the State. The more friable, rich, deep, soils are, however, the most suitable, and it is on this class of soil that the most serious damage is done. In these situations the plant makes rapid lateral root development from which it throws up shoots and thus quickly establishing a dense mass of growth. In what are popularly termed hard red soils there is not the same rapid spread, but there is no less difficulty in eradicating it from such soils.

Capsella Bursa-pastoris. *Shepherds Purse.*

Description.—An annual of up to 15in. in height, sometimes slightly hairy except the pods which are always smooth; leaves always at the base of flowering branch, they may be toothed or almost entire, and are stalked; any stem leaves are stalkless and clasp the stem; flowers are small, white, and terminate the flowering branch; pods are carried on a short stalk; they are of a characteristic shape, not unlike a shepherd's sporran, from which likeness it derives its name; seeds small, orange color, and oblong in shape; from 10-15 are in each cell on either side of the central partition. Flowering generally occurs from August to December.

Origin.—An Old World species which has become almost cosmopolitan.

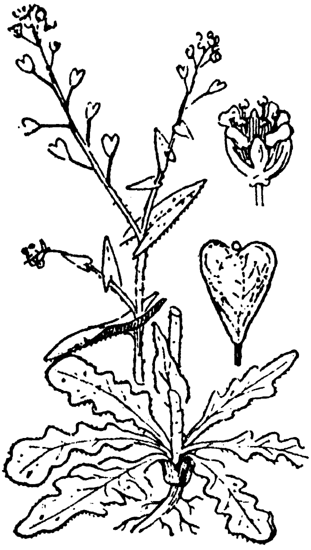
Localities where Found.—This plant has become established in almost all parts of the globe with the exception of the tropics. It can be found throughout this State.

Its Agricultural Importance.—It is of no great agricultural importance, but is of less account in cereal growing conditions than in pasture fields. In pasture it is useless, as animals will not graze it, but it seldom becomes excessively thick, and what damage is done is by competing with more useful plants. In permanent pasture it seldom offers any trouble, as more vigorous species eradicate it. There appears to be insufficient aeration in natural pasture for it to thrive.

Where cruciferous crops are of importance this weed is supposed to carry over from season to season some fungoid and insect pests to which the crop is liable.

It is suggested by Brenchley[6] that this weed is apt to cause hair-balls in the stomachs of animals if ingested freely.

Control.—In worked land little or no special measures are necessary to control it. In pasture everything should be done to encourage rapid development of the useful species which will by their competition eliminate it.



Capsella Bursa-pastoris. (L.) Moench.

The grading of cereal seeds will remove any of the seeds likely to occur as an impurity in cereal grain.

Soils Favored.—It shows little preference for soil type and can be found on all classes of soil provided they are well aerated.

Rapistrum rugosum. *Wild Turnip.*

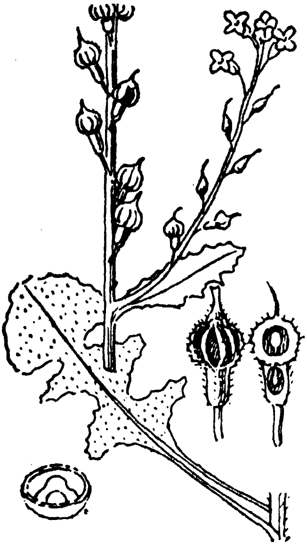
(Known also as Turnip Weed.)

Description.—A very vigorous growing annual, often attaining a height of 4-5ft.; slightly hairy; base leaves stalked and much divided, the final segment being the largest, often attaining a length of 8in.; stem leaves are stalkless, not so deeply toothed; flowering branches are greatly divided, carrying large numbers of bright yellow flowers; pods are short, pear-shape, and are borne on short stems which generally lie close to the flowering branch, the pods do not split, each one being hard, about ⅜in. in length without the terminal beak; two seeds may be in each pod; the one in the globular ribbed section is almost always viable, while that in the lower section may abort. Flowering occurs in the early spring and may continue till early summer.

Origin.—It is of Central and Southern European origin, but has become established in many other parts of the world.

Localities where Found.—This weed is gradually spreading throughout the State. It is very prevalent round Snowtown, Redhill, Georgetown, Kadina, and can be found on the railway reserves in many parts of the State.

Its Agricultural Importance.—Undoubtedly this is the most dangerous weed of this type in the State. Its vigorous growth and free seeding habits make it one of the worst of agricultural weeds. Upon germination the plant grows with unbelievable vigor, and because of its sprawling habit in early growth each plant will smother out quite large areas of crop. The root development is very rapid, and the plant is capable of making a second and sometimes third roothold if the soil conditions are at all moist after it has been cut off by cultivating implements. This feature of the plant makes it one of the worst weeds to control, and frequently necessitates the working of the land several times prior to seeding if great care is not exercised to prevent the plant from becoming well established in the first instance.



Rapistrum rugosum. All. (Wild Turnip.)

In a crop it causes great inconvenience at harvest time by reason of its thick fibrous stems being difficult to cut with a binder, and its much branched flower heads choke the reaping machine in a grain crop.

By reason of this continued blocking of the comb much time and grain is lost, besides which the seed adulterates the bagged grain so as to cause a dockage. It has been necessary at times to reclean wheat through a winnower before it could be sold through the ordinary channels because of excessive amounts of turnip seed in it.

In the early part of the harvest, if the weed is very prevalent, added to the mechanical difficulties involved, there is a danger of the bagged grain heating, through the excessive quantities of green leaf and seeds of turnips which find their way into the grain box and from there into the bags.

On fallows the weed is difficult to keep in check as it germinates with every addition of moisture, and if not killed will soon ruin the chances of a good cereal crop by its vigorous growth.

In pasture the plant is not very serious provided animals have access to it before it becomes too rank. In an ordinary way sheep will keep it under control, although care should be exercised not to kill ration sheep off a pasture which contains large quantities of the weed, for it often taints meat. The products of milch cows grazing the weed are likely to be tainted badly.

The plant does equally well in arable land or soil which receives no working whatsover and is one that frequently is found growing profusely on roadsides.

It is possible that the seed remains viable in the soil for a great number of years, although no information is forthcoming in that regard.

Control.—This desired end in cereal crops is often by no means of easy attainment. It is most essential to prevent the seedlings from becoming established with vigorous root development. This is executed most easily by cultivating the soil with wide-winged shares while the plant is still young. If on the other hand the plants are of any considerable size it becomes increasingly difficult to be sure that all the fibrous roots are severed. Even if they are, and rain should follow shortly after this working the plants will re-establish themselves. If such conditions as these prevail it is necessary to attempt a working of the soil prior to a week's fine weather—a phenomenon not easily attained; but by intelligent observation of weather forecasts some results may be achieved in this direction.

The use of harrows, particularly in conjunction with a cultivator, often leads to successful control of this plant, as the early use of harrows will destroy countless thousands of the seedlings, while even better results can be achieved with chisel or scarifier harrows. When conditions will allow, the use of a plate or melon cutter will greatly reduce the pest, but conditions are not always suitable for the use of this implement. In the same way it will generally be found that a set or bridle draught cultivator is more effective than spring tyne implements.

The crop sown should be one that will make rapid growth, capable of competing with the plants that are missed or should germinate later. It must be pointed out that in the attempt to eradicate the pest by cultivation every precaution should be taken to prevent excessively deep working of the soil, for if this is done it will seriously affect the vigor of the crop and allow it to be choked out by the weed.

Odd plants will invariably make their appearance in the crop. They are best dealt with by hand cutting in the spring, when their bright yellow flowers quickly indicate their position. It must be remembered that this work should be done sufficiently early in order to prevent viable seeds being matured.

In pasture, both sheep and cattle will keep it in check, but they must have access to it while still young otherwise they will not readily feed it.

The control of this weed is dependent upon efficient, early fallow intelligently worked after the first rains. Any mistake made in allowing the plant to become well established must be paid for by much work and poor results. The hand cutting of the weed in some years must be resorted to.

Care should be exhibited in the careful grading of any purchased cereal for the seed can be graded from such a sample only with difficulty.

Soils Favored.—The rich, friable, chocolate loams appear to be preferred by this plant, for although it can be found in all districts it is only in those soils of this character that the plant is serious.

In calcareous soils there is not the same vigor exhibited, although in some rather sandy calcareous types there is quite a profuse growth of the weed. Heavy red lands and the very friable black soils do not appear to be greatly favored.

REFERENCES.

2. L. H. Pammel: Manual of Poisonous Plants.
5. A. Morgan: *Victorian Journal of Agriculture,* August, 1931.
6. W. E. Brenchley: Weeds on the Farm.

(*To be continued.*)

FEEDING CAGE BIRDS.

[By W. J. SPAFFORD, Deputy Director of Agriculture.]

The keeping of cage-birds is rapidly becoming popular in Australia as it has already become in some of the older countries of the world, and as it is a hobby demanding much expense of time and money, anything helping towards success is of importance to the keepers of the birds. Because of this a short discussion on the feeding value of the foodstuffs suitable for small birds, which are readily obtainable on the local market, should prove useful.

Many of the birds kept in captivity can be maintained in fair health for a relatively long period of time by most people prepared to give them some little attention, but to be able to keep them in really good, healthy condition, and in good feather throughout their full life, a fairly complete knowledge of the requirements of these pets is essential. Besides the mere keeping of birds, it has become a fashionable pastime of recent years to endeavor to breed most of them in captivity, and although easy of attainment with some of the kinds, it is extremely difficult with others. Despite the difficulty, however, there are persons who have had success in rearing youngsters of most of the types which are shy breeders in cages, and without exception they are individuals who not only understand the housing of the birds, but also make a close study of food requirements, and who realise what substances will replace the foods the birds would have collected had they been at liberty. Success with the keeping of cage birds, and particularly with the hatching and rearing of youngsters, is largely connected with proper feeding, although, of course, correct housing is of importance.

FEEDING VALUE OF SEEDS FOR BIRDS.

Considerable work has been done in the determination of the composition and in working out the digestibility of the foodstuffs supplied to the larger of the domesticated livestock, but this is not the case with birds, other than for farm poultry. So little has been done in this connection that it is difficult to secure many analyses of the small seeds usually fed to birds, and to overcome this trouble the seeds on the local market have been analysed to show their feeding value, and the results, with the addition of the composition of a few other seeds, are shown in the table on next page.

The table has been divided into four sections, viz., (*a*) Composition, (*b*) Digestible nutrients, (*c*) Starch equivalents, and (*d*) Nutrient ratio, so that a reasonable sort of comparison can be made between the different foodstuffs.

When a foodstuff is submitted to a chemist for analysis it is usually split up into recognised fractions according to the possible maximum feeding value of the substance, and is subdivided into (1) Water, (2) Ash, (3) Crude protein, (4) Fat, (5) Nitrogen-free extracts, and (6) Fibre. It is known, however, that when put under actual feeding tests the various nutritive constituents of different types of foodstuffs vary as to their digestibility, and so the chemical composition of any foodstuff does not necessarily show its actual feeding value. The portion of the table showing *digestible nutrients* is derived from actual digestibility tests with animals, but can be used with safety in connection with the feeding of birds, because their powers of digestion are, if anything, greater than with the larger of the domesticated animals.

The *Starch equivalent* figures for all the foodstuffs shown are strictly comparable one with the other so far as their powers of (*a*) promoting the development of fat, or (*b*) the maintaining of condition, are concerned. These figures show, from actual feeding tests, the power of each foodstuff to produce fat, compared to pure starch which is wholly digestible.

FEEDING VALUE OF SEEDS FOR CAGE BIRDS.

Seeds.	Composition.						Digestible Nutrients.				Starch Equivalent.	Nutrient Ratio.
	Moisture.	Ash.	Crude Protein.	Fat.	Nitrogen-Free Extracts.	Fibre.	Crude Protein.	Fat.	Nitrogen-Free Extracts.	Fibre.		
	%	%	%	%	%	%	%	%	%	%	%	
Highly Proteinous—												
Subterranean Clover	7·0	4·7	36·3	15·2	28·4	8·4	31·9	12·6	24·4	5·5	84·0	1 to 1·8
Fenugreek	7·0	3·1	25·1	5·8	51·2	7·8	22·1	4·8	44·0	5·1	77·6	1 to 2·7
*Pea Meal	7·0	3·6	24·6	3·6	56·5	4·7	21·2	2·3	52·5	2·2	77·9	1 to 2·8
*Peas	7·0	2.6	24·3	2·2	57·0	6·9	20·9	1·4	53·0	3·2	77·2	1 to 2·8
Starchy—												
Wheat (63¾lbs. per bush.)	7·0	1·7	8·5	1·8	78·4	2·6	6·8	1·1	72·1	1·3	79·6	1 to 11·1
Wheat (50⅞lbs. per bush.)	7·0	1·6	9·9	1·8	76·5	3·1	8·7	1·2	68·5	1·6	74·4	1 to 8·4
†Barley (Prior)	7·0	2·9	8·6	1·4	75·8	4·3	6·0	1·3	69·7	1·4	78·7	1 to 12·3
†Barley (Roseworthy Oregon)	7·0	2·8	12·3	1·2	70·8	5·9	8·6	1·1	65·1	1·9	77·6	1 to 8·1
*Maize	7·0	1·6	10·9	7·0	67·5	6·0	7·8	6·2	64·1	3·5	88·1	1 to 10·4
Canary Seed (Imported)	7·0	5·5	17·2	5·5	59·1	5·7	12·9	4·4	53·2	1·9	72·7	1 to 5·0
Canary Seed (Local)	7·0	6·0	15·3	6·2	58·7	6·8	11·5	5·0	52·8	2·2	72·6	1 to 5·7
White Millet (Imported)	7·0	5·0	12·2	3·9	66·0	5·9	9·1	3·1	49·5	2·0	63·3	1 to 6·4
Red Millet	7·0	4·1	11·7	3·8	64·1	9·3	8·8	3·0	48·1	3·1	62·5	1 to 6·6
White Panicum (Queensland)	7·0	3·4	14·0	4·9	63·2	7·5	10·5	3·9	47·4	2·5	64·6	1 to 5·6
*Buckwheat	7·0	2·0	9·7	1·6	63·5	16·2	7·5	1·6	48·3	3·9	58·3	1 to 7·4
†Oats (Algerian)	7·0	3·6	10·1	5·2	60·8	13·3	7·7	4·2	46·2	3·7	62·7	1 to 7·9
Oat Meal	7·0	5·4	16·7	6·8	56·3	7·8	13·0	5·6	43·4	3·8	69·2	1 to 4·6
Oily—												
Rape	7·0	3·7	17·6	44·2	20·2	7·3	14·3	42·0	16·2	1·8	131·3	1 to 7·7
Maw	7·0	7·0	20·2	43·8	14·7	7·3	15·1	41·6	13·5	2·4	129·0	1 to 7·1
Linseed	7·0	4·0	17·9	41·3	23·6	6·2	14·3	39·2	18·9	2·0	127·5	1 to 7·5
Turnip	7·0	3·7	20·6	39·5	20·8	8·4	16·7	37·5	16·6	2·1	123·5	1 to 6·0
Niger	7·0	5·0	22·4	39·0	14·4	12·2	18·4	36·3	10·8	5·6	120·0	1 to 5·2
Hemp	7·0	4·9	21·9	28·6	18·1	19·5	16·4	25·7	14·5	11·7	99·4	1 to 5·0
Wild Artichoke (Thistle)	7·0	4·2	19·9	21·1	29·4	18·4	14·9	18·4	14·7	11·0	90·3	1 to 4·4
Black Sunflower (South Africa)	7·0	2·7	17·6	29·6	21·0	22·1	15·8	28·1	14·9	7·3	96·4	1 to 5·3
Grey Sunflower	7·0	2·4	17·9	28·6	19·8	24·3	16·1	27·2	14·1	8·0	94·6	1 to 5·1
Sunflower Kernels (55·05 %)	7·0	2·5	28·7	49·3	10·2	2·3	24·4	42·9	5·6	1·8	122·5	1 to 4·2
Sunflower Husks (44·95 %)	7·0	2·3	3·9	2·1	32·2	52·5	1·2	1·1	16·1	18·4	15·6	1 to 30·8

NOTE.—All analyses carried out by the South Australian Chemistry Department in 1933, except the three marked †, which were done at Roseworthy Agricultural College, and the four marked * which are European figures.

The *Nutrient ratio* shows the relative proportion of the portions of the feed producing growth, energy, milk, eggs, muscle, &c., to those parts leading to the development of fat or condition. When fattening animals it is essential to use foodstuffs rich in fat-producing materials, as it is also when maintaining animals in fair condition and good health, but when endeavoring to get best results from animals producing and rearing young, it is necessary to provide foodstuffs rich in proteinous substances. A wide *nutrient ratio, i.e.*, a lot of fat-producing constituents and a small amount of protein is looked for when fattening animals, and a narrow *nutrient ratio, i.e.*, a lot of protein and a relatively small amount of fattening substances is required for the production of milk and eggs, and for the proper development of growing youngsters.

PALATABILITY OF THE FOODSTUFFS.

One of the important characteristics of foodstuffs, which cannot be shown by analysis, is palatability, and this can only be discovered by actual feeding tests when the animals are allowed to take their choice of different feeds, and show their preference for certain kinds. Birds of most kinds have a very strong liking for certain types of seeds, and although other seeds might be of equal, or even higher feeding value, and procurable at a much lower cost, it is sometimes necessary to ignore nutritive values and allow palatability to be the deciding factor on what is to be provided.

NUTRIMENT REQUIREMENTS OF CAGE BIRDS.

The nutriment requirements of cage birds vary between very wide limits according to the type of bird being considered, as can be readily realised by remembering that the different classes of birds eat quite different kinds of foodstuffs, as, for instance, finches taking all the kernel of small seeds, the pigeons and doves swallowing husks as well as kernels, the parrots only using portion of the kernels, insectivorous birds requiring much animal food, &c., &c. Because of great differences it is almost impossible to state briefly what are the requirements of the birds, but in a general way it may be stated that to keep seed-eating birds in good condition the seed mixture should provide—

Moisture, 5 to 10 per cent.—About the amount present when purchased.

Crude protein, 15 to 25 per cent.—The higher amount at nesting time.

Fat, 7 to 20 per cent.—The addition of oily seeds to the mixture is necessary to reach these figures.

Carbohydrates, 45 to 60 per cent.—Most of the seeds usually given to cage birds contain plenty of carbohydrates.

Starch Equivalent, 65 to 80 per cent.—Most birds do not require much fibre or moisture in the seeds, both of which lower the starch equivalent. If kernels freed from husks are being considered the starch equivalent should be somewhere nearly 100 per cent.

Nutrient Ratio, 1 to 5.—The ratio can be narrowed a little at nesting time.

MIXTURES OF SEEDS FOR BIRDS.

It is unreasonable to expect any birds to do well if supplied with only one kind of foodstuff, for it is impossible to get a single variety of seed which fulfils all of their nutriment requirements, although seeds such as Canary Seed and the Millets approach them fairly closely. In a state of nature the birds may be compelled to feed on the one kind of seed for periods, but in the great majority of cases this only occurs for short periods of time and rarely persists for more than one season of the year. Being natural for birds to consume a variety of foodstuffs it can be expected that better results will follow the feeding of mixtures of seeds to birds in captivity, and this is found to be so in practice. When actual mixtures which are to be cleaned up by the birds are used, it is first necessary to know what seeds are readily eaten by the particular birds to be fed, and then mix them in such proportions that the mixture will contain the nutriment required by the birds. The calculation of the proportion of the various seeds to be used in a mixture is a simple matter when the *composition, starch equivalent,* and *nutrient ratio* are known, as the following instances of proved mixtures show:—

Making of Seed Mixtures for Cage Birds.

	Principal Nutrients.				Starch Equivalent.	Nutrient Ratio.
	Water.	Crude Protein.	Fat.	Carbohydrates.		
	%	%	%	%	%	
Canary Seed	7·0	16·2	5·8	58·9	72·6	1 to 5·3
Millet	7·0	12·6	4·2	64·4	63·5	1 to 6·2
Rape	7·0	17·6	44·2	20·2	131·3	1 to 7·7
Oatmeal	7·0	16·7	6·8	56·3	69·2	1 to 4·6
Canary Seed, 75% Rape, 25%	7·0	16·6	15·4	49·2	87·3	1 to 5·9
Canary seed, 45% Millett, 40% Rape, 10% Oatmeal, 5 %	7·0	14·9	9·0	57·1	74·7	1 to 5·9

Although it is a common practice to supply mixtures of seeds, it is probably better to provide the principal seeds in separate vessels and allow the birds free choice, and then if it is desired to give some of the very palatable but high-priced seeds, or specially fattening foods, or seeds rich in protein at nesting time, limited quantities of these can be mixed with any one of the main seeds, or be given in separate containers.

LIVE SEEDS.

Better results are usually secured by using live seeds instead of long-dead seeds. This appears to be due to the fact that certain of the vitamins so essential to the healthy development of animals disappear from seeds after they have been dead some time, and some of the nutrient constituents, and particularly the fats, seem to lose some of their digestibility with age. If the birds show signs of unhealthiness, one of the first things to do is to procure a fresh supply of seeds with a guarantee that they are still alive, or if no guarantee is forthcoming, the viability of the seeds should be tested by germinating them between a couple of pieces of blotting paper or cloth kept damp for a few days.

"INSECT" FOODS.

A great number of the different kinds of birds kept in captivity eat insects and animal foods as well as seeds, and as it is very expensive and often quite impracticable to keep them supplied with sufficient insects, it has become customary to provide a mixed food to partially make up the deficiency, and such foods have become known as "Insect" foods. For the purpose a useful mixture would be:—

Oatmeal 2 parts.
Peameal 2 parts.
Unsalted lard 1 part.
Rice powder 1 part.
Honey 1 part.
Sterilised bone-meal 1 part.

This mixture would be improved for insectivorous birds, and at nesting time for others fond of it by adding meat meal, blood meal, or fish meal at the rate of about ½ part, provided the mixture is made afresh every day, and be not allowed to stand in the cages until any decomposition had taken place.

SHELL GRIT.

It is essential that all cages be well stocked with some substance rich in lime, and this is of particular importance where attempts are being made to breed birds in captivity. As shell grit is very cheap, supplies the lime required, and is suitable as a grit for the pulverising of the food after swallowing, a plentiful supply should always be available to the birds. A simple way to provide the shell-grit is to cover the whole floor of the cage, which practice adds very considerably to the attractiveness of the cages, and for showing off the birds.

PHOSPHATES.

Despite the fact that it is well known that all other animals suffer from a shortage of phosphates, and that a great many of the sicknesses experienced by those kept in captivity are due to or encouraged by a lack of these substances, it is not generally recognised by the keepers of small birds that it is just as essential to make up this deficiency for their pets as it is for poultry keepers and livestock husbandmen generally. Many of the sicknesses, and particularly those of the type of rickets, would in all probability completely disappear from aviaries if a supply of a phosphatic grit was always before the birds. The *Sterilised Bone Grit* on our market is ideally suited for cage birds, supplying the phosphates so necessary, and acting as a food-grinding grit as well.

MEAT.

No matter how extensive the aviaries, birds in captivity have practically no opportunity of obtaining a reasonable supply of live insects, but these are not missed to such a great extent if besides the "insect" food the birds frequently have access to bones still carrying a little meat, or to pieces of fatty meat, such as mutton flaps.

SUNLIGHT.

Although it is possible to keep some birds for relatively long periods in shaded locations, the vast majority of them do very much better if they can sun themselves with regularity. The health-giving properties of sunlight are only due to a slight extent on the warmth provided, and are largely brought about by the effects of the rays of light received direct from the sun. All aviaries and cages, no matter how large or small, should be so located that the birds can get into the sun every day that it shines, and the more sunlight available the better the health of the birds.

GREENFEED.

A plentiful and constant supply of greenfeed is essential if cage birds are (*a*) to make full use of other foodstuffs provided, (*b*) to keep in good health and good feather, and (*c*) to have a reasonable chance of rearing young to full maturity.

In a climate such as ours there is no reason why there should be a shortage of greenfeed at any time of the year, but should this happen, the deficiency can be made good by germinating seeds such as wheat, rye, barley, oats, &c., and when the shoots are well out, giving the seeds to the birds.

Where gardens are conducted as well as the keeping of cage birds all weeds pulled should be thrown into the cages with soil still adhering to the roots. Besides being able to eat some of the green stuff, the birds delight in searching through the fresh soil for minute insects, in many cases so small that they are hardly visible to the human eye.

As birds appear to prefer to pull at growing plants rather than peck pieces off loose leaves, whenever possible an ample supply of growing plants should be maintained. In large aviaries plenty of plants should be grown, including grasses and ordinary pasture plants, and if the birds are punishing any of these too severely, frames covered with wire-netting should be thrown over them occasionally and be left until the plants recover. Where sufficient growth cannot be kept going in the aviaries to supply all the wants of the birds, plants should be grown in boxes and pots, and be allowed to remain in the cages until partially eaten down, when they should be removed to recover, and be replaced by others. For the purpose such perennials as Lucerne, Many-flowered Millet Grass, *Phalaris tuberosa*, Prairie Grass, Cocksfoot, &c., can be grown without much trouble. Annuals which are much relished by many cage birds, such as Lettuce, Rape, &c., could be grown in pots and be left in the cages until consumed by the birds.

Most birds enjoy eating maturing seeds, and as these are plentiful in the spring season when the birds are nesting much benefit is derived from their consumption. Most of the grasses which grow as weeds are suitable for the purpose, and if the seed-heads are plucked and given to the birds when the seeds are approaching maturity, but are still soft, they appreciate them very much indeed. It is a simple matter to grow plants with this aim in view, such plants as the cereals—Wheat, Barley, and Oats—being grown in the winter, and the Millets—White and Yellow—and Miniature Sunflowers in the summer.

ORCHARD NOTES FOR SOUTHERN DISTRICTS FOR JUNE, 1933.

[By CHAS. H. BEAUMONT, District Horticultural Instructor, &c.]

Complete the planting of young trees and vines, and see that water is not able to lay about them.

Pruning is the main work to get on with; light pruning is recommended, unless it is absolutely necessary to make big cuts. If big cuts are made, trim them at once, and paint the cut with white lead paint. Any cuttings required for grafts may be heeled in under the tree until wanted.

Spray citrus with Bordeaux to control "brown rot," and keep a mulch about the trees.

Keep tomato houses open to the weather, and dig in all weeds, both in and around the house.

Strawberry beds should be dug and kept free from weeds.

Planting of walnuts is recommended in rich loam, in localities with a good rainfall; resistant stocks must be used; Franquette is a good variety.

Arrangements should be made so that olives are not wasted.

Trellised vines are often in trouble because of the twisting on the wire. This does not hurt the young vine to any extent, but as the vine gets older, the wire cuts into the arms and causes considerable damage to the vine and a lessening of the crop. There is a difficulty in fastening the vine to the trellis, the use of any ordinary tieing material seems impossible, so I suggest that a type of S hook may be useful. The top loop should be small, so that it may be closed upon the trellis wire in a way that it will move freely, but cannot come off, and the lower loop be of such a size as may be required to fit the arm, but will open as the hook grows, or be easily opened with the fingers or a pair of pliers; the hooks would be made of No. 8 or 10 wire, and can be obtained at a cheap rate per 1,000 from wire workers.

Orchards must be protected from surface flood waters.

Apples in store require examination, and the removal of any rotting fruits.

THE HOME GARDEN.

[By J. B. HARRIS, Dip. Hort., Horticultural Instructor.]

Gardening in the sense of making a garden as an adjunct to the home, is not widely practised in the Lower and Middle Northern farming areas of South Australia, and it has been suggested that a short article on the subject might stimulate interest in it and thereby assist in making farm life more attractive.

Few, if any, persons will dispute the contention that a garden adds attraction to the home; the form of attraction, however, may vary from the aesthetic attraction of the pleasure grounds or flower garden to the more utilitarian attraction of the kitchen or vegetable garden and the fruit garden. The scope of this article will include brief references to all three phases of the gardener's activities.

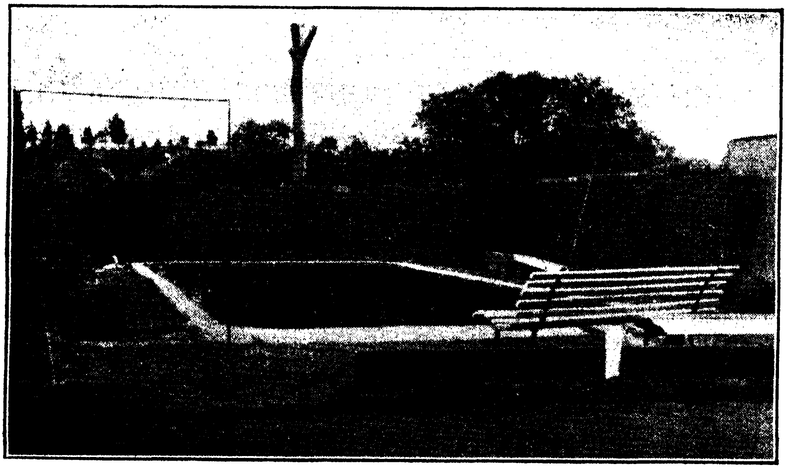


Fig. 1.—Messrs. J. & D. Victorsen's garden, "Ingomar," Clare, showing irrigation water conserved as a swimming pool.

To deal comprehensively with the subject in its application to an area with a rainfall varying in different parts from 35 inches down to 10 inches, and subject to periodic droughts, is impossible in this limited space, and some readers may feel inclined to dismiss the matter as being a physical impossibility in an area of low rainfall; the impossibility is imaginary, however, rather than real, for a garden, broadly speaking, may vary from a window-box or a much-prized verandah collection of Fuchsias, or other plants, in kerosene tins, to the extensive acreages cultivated by a large staff of professional and journeymen gardeners, assisted by laborers and potboys, and the amount of pleasure derived from the garden by the owner is not necessarily in direct relation to its size. To derive pleasure of the aesthetic, rather than the gastronomic kind from a garden, it is first necessary to have at least visual and olfactory access to it, and to have, and cultivate, an appreciation of form, color, and scent. Given these latter attributes, which, fortunately, most persons possess to a greater or less degree, the size of the garden becomes a matter of secondary importance. After seeing many gardens, including some of the world's finest, the writer has outstanding pleasant recollections of a wall garden containing chiefly Pansies and Mimulus, growing in a compost on a flat-topped wall surrounding the few square yards of paved court outside the gardener's cottage on a Scottish estate, with a small central raised bed in the paved court and two tubs containing clipped Box-trees at either side of the cottage door; also the Cedars on the lawn and the Japanese garden, to mention only two features of one of the Rothschild's gardens at Gunnersbury Park in England; and in later years the pleasure derived from seeing a fine collection of Pelargoniums (sometimes called Geraniums) growing well in kerosene tins along the foot of a brick wall at Clare, the beauty of the well-grown plants in full bloom being much enhanced by the fact that the brick wall was old, moss-grown, and falling into ruin, the bricks fretted with age and exposure and the kerosene tins rusted and holey, showing the varying tints of the brown earth they contained, the whole being flanked by stately dark-green Pine trees. Other local instances which come to mind are the beautiful use made of Cactus blooms in a floating bowl as a table decoration where little or no water had been available to grow the Cacti, and the refreshing green of two small trees—Quince and Fig—kept alive by household waste water, in a vast area where at that time of drought no other green plant could be seen.

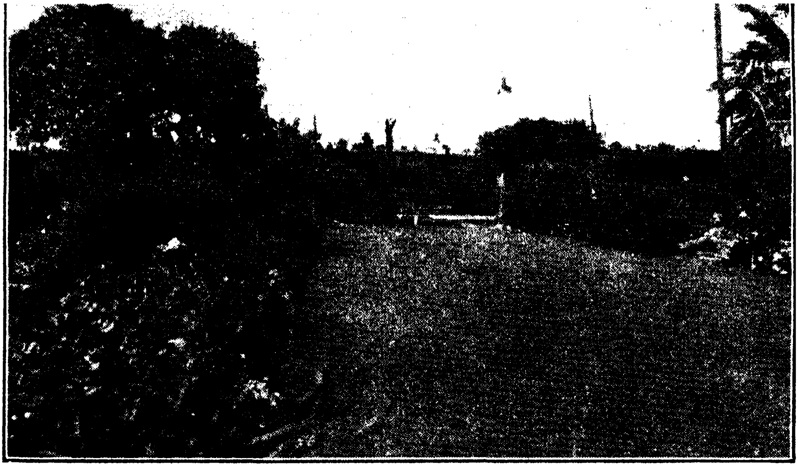


Fig. 2.—Messrs. J. & D. Victorsen's garden, "Ingomar," Clare, showing lawn and swimming pool in distance.

Something in the way of gardening can therefore be accomplished and much pleasure derived from the achievement in the sometimes rather arid areas of the North of South Australia. Before proceeding to write of the more practical aspects of gardening, appreciative reference may here be made to the stimulus given to Horticulture in South Australia by the inclusion at the Royal Show of the Model Gardens which compete for the Lady Hore-Ruthven Challenge Cup. This section of the Show is obviously bearing fruit in the development of artistic gardening in this State.

WATER.

For the making of a garden, as generally understood, some water is a fundamental necessity, also there must be some cost involved in the making of a garden. These two factors are closely related, for provision of water in a climate such as this is generally the biggest item in garden economics, unless the gardener is a collector of rare and costly plants, and assuming that the bulk of the labor will be regarded as a pleasant exercise and recreation rather than a charge against the garden. The area of the garden is another factor which materially affects the cost of development and maintenance, and to be well cultivated, half an acre or less will be quite sufficient to occupy fully the spare time which an average person can devote to it. Maintenance all the year of even a small garden such as that suggested will require provision of a reticulated water service, and where this cannot be obtained from water mains, it must be raised from a well or bore or caught in a dam, and in either case raised to such a height as to permit of reticulation. As previously stated, this will be probably the most costly item in the development of a garden; the cost will vary according to circumstances, but in a few cases which have come under notice, a satisfactory pumping plant, including a second-hand petrol or kerosene engine of 2 or 2½ horsepower, has been obtained for about £25. The figure quoted does not, of course, include the cost of the well, dam, or storage tank. Cheaper, but less dependable pumping can be provided by use of the windmill. An aspect of this matter which should not be overlooked is the possible provision of a reticulated water service throughout the home which can be provided when making provision for garden reticulation without extra cost for pumping plant; and in extreme cases where the water supply is limited, some worth-while gardening can be done with water which has been used for domestic purposes and subsequently crudely filtered through straw and charcoal and used to irrigate a small garden plot.

An interesting feature of the garden of Messrs. J. & D. Victorsen at "Ingomar," near Clare, is the storage of water in an underground concrete tank in the form of a swimming pool situated at the end of the lawn. Water is pumped frequently into this pool, which is in the higher portion of a partially terraced garden and drawn off at the bottom level to irrigate portions of the garden.

Irrigation of Prune and Lucerne crops during a dry year has, by increasing yields, helped to defray the cost of the storage pool, the chief item of cost of construction being cement, as sand, gravel, and labor were already available. The pool, as may be seen from the accompanying photographs, is partially enclosed by square latticework on which are trained Clematis, Tecoma, Bougainvillea, and Dolichos spp. Another noteworthy feature of this garden is the exceptionally fine lawn, which is regularly used as a private bowling green.

LOCATION.

The site of a garden is almost invariably governed by the situation of the house, but where new houses are being built on broad acres, some consideration may well be given to the relationship of the house and garden to the surrounding country, as well as the relation of the garden to the residence and adjoining buildings. The matter of shelter and possible vistas should be considered in relation to both house and garden, and also aspect, for this is a big factor in governing the amount of sunshine and heat.

Many commonly grown garden plants thrive best under the influence of the morning sun and afternoon shade, and therefore an eastern or south-eastern aspect, or a garden so laid out as to provide the most extensive eastern borders is desirable. Some good houses in the country built on broad acres have been partially spoilt by being built so close to an immovable main road that it is impossible to lay out an adequate garden as an adjunct to the home. An instance of the avoidance of the mistake is shown in Figure 3, where a garden in the early stages of development is seen; the house has been built well back from the road and a well-planned drive—accommodation for four-wheeled vehicles being necessary for practically every country house—with a turning space to permit vehicles to approach and leave by the same entrance, is shown.

SHELTER.

As already stated, when selecting the site for a garden, full advantage should be taken of any available topographical protection or shelter, then when laying out the garden, the provision of shelter by planting suitable ornamental trees will only be necessary where the surrounding country does not provide enough protection. Trees for shelter are generally planted exterior to a small garden, and need not necessarily consist of one or two rows of Eucalypts just outside the garden boundary, where, as they become aged, they frequently provide little or no shelter and rob the garden of much moisture.

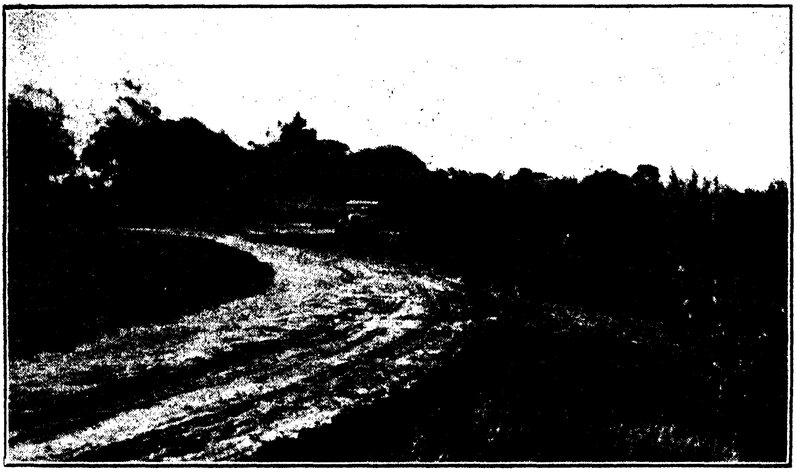


Fig 3.—A garden in early stages of development. Note location of house and well-planned drive leading to main road. Mr. W. Dempster's, near Tanunda.

Suitable and ornamental shelter can be provided on broad acres by planting various groups of trees in the adjacent paddocks at some distance from the garden, where, by careful arrangement of groups, they will provide protection for the home and garden and at the same time be ornamental and provide shade for stock. The choice of trees will vary greatly as the district varies from the hill country of Mount Crawford, through Angaston, Clare, and Wirrabara, to the more open plain country with less rainfall and greater heat. Amongst the beautiful and fairly common trees to be found in the district cultivated for shelter and ornament are Horse and Spanish Chestnut, Sycamore, Oak, Ash, Poplar, and Birch; also Pines and Eucalypts of various species and Olive and Almond, &c.

THE LAY-OUT.

When laying out a garden the first necessity is to know what it is to include—whether pleasure garden, kitchen garden, or fruit garden or a combination of all three, and whether a tennis court is to be included; and to be more prosaic, a drying green.

In deciding the lay-out, prepare sketch plans, and finally a scale plan, and work to the latter. When preparing the plan—and in the case of new houses the plan should be prepared by the lanscape gardener, whether professional or amateur, working in conjunction with the architect or builder—take into consideration water service pipes, standpipes and drains, and so far as possible, avoid laying these under permanent paths and lawns, as they will be more accessible for any subsequent repairs if laid under cultivated ground used for cropping or bedding-out.

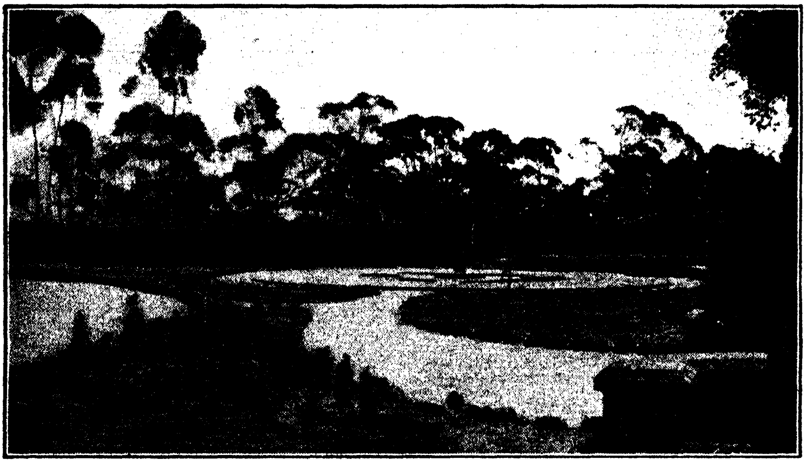


Fig. 4.—Portion of Mr. F. P. Shipster's garden at "Kalimna," near Nuriootpa, shortly after being laid out.

Lawns are a most valuable feature of a pleasure garden, and if only intersected to the minimum extent by paths and flower-beds, they tend to add to the impression of area of the garden. Long straight paths, if suitably proportioned, are valuable also where it is desired to increase the impression of size in a small garden, and this purpose can be even better achieved by bordering the path with two grass verges of 12 inches or thereabouts in width. Curved paths are—on the other hand, if suitably proportioned—attractive, and if bordered by tall growing herbaceous plants, shrubs, or hedges, serve to add interest by providing fresh prospects around the curve. Where no verandah is attached to the house, paths should run alongside the main walls, because this situation frequently is shaded, and in many cases it is desirable to keep water away from the foundations, by avoiding watering alongside the walls, and making paths with a slight camber away from the building.

A reasonably wide and spacious drive, as in Figure 3, is a great asset as an approach to a house and garden, or as a part of the garden, and other walks and paths should be sufficiently wide to permit two persons to walk abreast, also to permit of the use of a wheelbarrow.

The present day tendency in the best gardens is towards massed bedding, *i.e.*, whole beds devoted to the cultivation of one species or variety of plant, rather than to the old-fashioned carpet bedding schemes, where beds were planted in a formal pattern with a variety of small plants; it is therefore a great mistake, and more costly for edging material, to divide the flower garden into a large number of small plots, as is still sometimes done. Larger beds are much more easy to dig and cultivate thoroughly, which is essential for the production of fine flowers, and provide very much better massed color effects.

Space will not permit of lengthy reference, at this juncture, to the matter of garden boundaries in the form of hedges or fences, to the Rock Garden, an example of which is shown in Figure 5, Herbaceous Borders, the Rose Garden and bedding-out schemes, all of which follow as a natural sequence to the laying out of a pleasure garden.

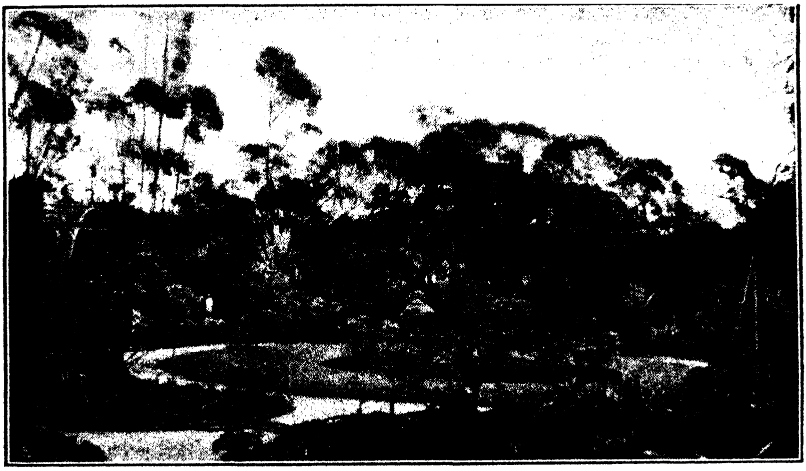


Fig 5.—Mr. F. P. Shipster's garden. Note the rock garden, planted with cacti, in background.

VEGETABLES FOR THE NORTH.

To many persons resident in the Northern Areas, where vegetables are frequently costly, and not always fresh, the following notes on a few vegetable crops may be of interest:—

Brassicas or *Cabbage Family.*—Sow in January and February and plant out at about six weeks.

Cabbage.—A good rich soil with plenty of farmyard manure—rather a heavier soil than for turnips—is best for cabbage. On very heavy soils, lime should be added; nitrate of soda or sulphate of ammonia are good manures for this crop. Sow in seedbeds of well-pulverised soil and lightly roll or beat seed into ground. Protect from birds and keep moist. Thin seedbeds before planting out. Plant out 1ft. to 1ft. 6in. apart in rows 2ft. to 2½ft. according to size desired and variety. During dry weather plant in deep drills. Soak seedbeds before planting out. Water ground day before planting and grow fairly dry. Avoid overcrowding in seedbeds and discard "leggy" plants.

Cauliflower.—Similar to cabbage. "Greenleaf" variety is very hardy and does well on a heavy clay soil. Heads should never be exposed to sunlight.

Root Vegetables for Winter.—Sow in March and April.

Beetroot.—Rich sandy loam manured for a previous crop will best suit this crop. Ground should be well dug over for turnip-rooted beet, or trenched if long roots are required. Contact with fresh manure causes roots to fork badly. Steep seeds in water and sow while still damp in drills 1½in. deep, 12in. to 15in. apart, and thin plants to 8in. when 2in. high and again when they have made six leaves.

Carrot.—A deep sandy loam or alluvial soil is best. Cold clay ground is unsuitable, and stony land makes the roots fork. No fresh manure should be used. Ground should be trenched for long-rooted sorts. Drills should be 12in. apart and plants 6in. in the rows. Cover seed lightly with fine light soil and peg ends of drills to facilitate hoeing before carrot seedlings appear. Thin twice, first thinning when plants large enough to handle and second thinning when small carrots can be used. Steep seed and keep warm to start germination.

Turnip.—Sandy soils and loam with much sand suit this crop. Farmyard manure and bonedust are good. Stiff soils tend to make turnips run to seed. Seed may be sown broadcast where small roots are wanted, or in shallow drills 15in. apart and ground lightly rolled or trodden. Grow with plenty of moisture as a check in growth produces stringy roots. Thin when first rough leaves appear 4in. to 6in. apart.

Parsnip.—Favors a rich deep soil and open situation. Ground should be trenched and manured in spring for autumn sowing. Sow thinly in drills 18in. apart. When 2in. high thin to 12in. apart or to 15in. for large roots.

Onions.—Sow in March and plant out in May and June. Onions will succeed in most soils, but well-drained soils provide best keeping onions. Poultry manure is most valuable or stable manure which has been applied for a previous crop. Ground should be thoroughly and finely dug one spit deep. Light soil should be rolled and heavy soil lightly rolled if not wet. Plant in beds 4ft. wide in drills 8in. apart or 12in. for larger sorts. Sow in very shallow drills, cover with a little fine soil, and tread or roll lightly. Drill may be made by pressing a round rod into ground. Deep sowing tends to produce thick necks. Culture consists mainly of weeding, thinning, and watering. Do not cultivate deeply. Cease watering and break necks if plants show tendency to bolt.

Potatoes.—Plant in February and March for early crops; August and September for main crop; or in July in localities which are entirely free from frost. Potatoes may be grown on any garden soil provided it is not too wet and heavy, but land which has been long cropped and manured does not produce such good crops as new land, hence field cultivation pays best. Farmyard manure dug in is the best fertiliser, but direct contact with manure induces "scab." Round seed selected from a heavy crop makes best "sets." Plant sets 12in. apart in rows 2ft. to 3ft. apart according to variety. Plant 6in. deep. Keep ground well worked and plants earthed up as they grow.

Leguminous Crops.—Peas: Sow in May and June or in February to April if able to irrigate. A rich friable loam with plenty of lime, deeply dug to encourage deep rooting, is desirable. Good drainage is essential, but the crop must not be allowed to get dry, particularly after flowering. Sow in drills from 3ft. to 6ft. apart according to height of variety. Dwarf sorts may be sown 1ft. 6in. to 2ft. apart. Sow to a depth of 2in., a double row in a wide drill. One pint of seed to each 50ft. of drill. Tread drill lightly after sowing to pack soil about the seed. Earth up when very young, and stake or net before haulm bends over. Moisten seed and roll in powdered red lead before sowing if mice are bad.

Broad Beans.—Sow as above for peas. The broad bean prefers deep well-drained strong loam. Shallow soil is unsuitable. Plenty of animal manure and bonedust. Sow in drills 2ft. 6in. apart and 3in. deep. Seeds placed singly 4in. apart, cover with soil and make firm. Earth up when 6in. high. Pinch tops above the fourth flower truss and burn tops if attacked by aphis. Twine and occasional stakes are useful to stop plants from falling over. Steep seeds in warm water before sowing.

SUMMER VEGETABLES.

French Beans.—Sow in September, October, and November. Sandy loam is the best soil for this crop, but any well-prepared garden soil will do. No manure is required where ground has been recently well manured for a previous crop. Where required, well-rotted stable manure should be used. Steep seeds for six hours before sowing. Sow in drills 1½in. deep and drills 2ft. apart; plants should be 4in. to 6in. apart in the rows. Runner beans may be grown thus and topped if desired. Some earthing-up may be desirable for certain varieties.

Trombones, Marrows, and Melons.—Sow in September. Sow seed in beds 4ft. to 6ft. apart each way on good ground well manured for a previous crop, or beds may be made by removing top soil and putting in half-decayed manure, then replacing top soil 9in. deep. Water frequently and thoroughly. Cut marrows while still young to ensure continuity of supply.

Tomatoes.—Seed is sown in well-drained seedboxes in July and August and later in beds of well-prepared fine soil in the open. Good drainage of seedboxes is essential to prevent damping off. Plant out in September, October, and November, providing shelter in the form of halved kerosene tins, sheets of glass, or leafy branches for early plants. Disbud plants and train three main branches to stakes or trellis. Water in furrows between the rows, which should be 2½ft. to 3ft. apart, with plants at least 1ft. 6in. apart in the row.

THE FRUIT GARDEN.

A garden such as that suggested will be large enough to permit of a plot being devoted to the cultivation of a few fruit-trees to be trained on the inverted cone or half-open umbrella style. Fruit-trees should not preferably be grown in the vegetable garden, because the trees exclude necessary light from the vegetable crops, and the irrigation and manurial requirements of fruit-trees and vegetable crops do not coincide.

Where it is desired to grow fruit-trees in the vegetable garden, they should be trained as fan-trained trees, or single and double, and sometimes treble, cordons against walls or fences or trellised alongside paths, where they will add considerably to the interest and utility of the garden. The training of trees according to the styles mentioned for trellising, together with other styles for the same purpose, is one of the highest forms of the gardener's art, and the amateur will do well to confine his first efforts to trees of the inverted cone type first mentioned. Whereas most of the Stone and Pome fruits can be successfully cultivated in the hilly parts of the Northern District, where the rainfall is heavy, the areas of lighter rainfall are better suited to the cultivation of the Apricot and Peach, together with Prunes. In all areas—but particularly in the areas of low rainfall—it is desirable to plant a few varieties of grapes in the garden to be trained as trellised vines. A list of varieties of Fruit Trees and Vines can be had on application to the Department of Agriculture.

The Woods and Forests Department has supplied the following list of trees suitable for planting in the northern areas:—

(*a*) *Hills,* such as Williamstown, &c.—Plant Acacias, Cupressus, Sugar, South Australian Red, South Australian Blue, Tasmanian Blue, Tuart, Spotted Gums, various Pines, Poplars, Willows along creeks, White Acacia and White Cedars.

(*b*) *Plains.*—Plant Acacias, Carob, large-coned and erect Cypress, Sugar and Tuart Gums, White Cedars, Canary Island, Aleppo and Maritime Pines, White Acacia, Pepper Trees, Kurrajong and Tamarisk (near the coast).

(*c*) *North,* outside Goyder's line of rainfall.—This area is restricted to Pepper Tree, Tamarisk, and perhaps Cypress, but all will need water and attention in the young stage.

CALF REARING.

[By H. J. Apps, Senior Dairy Instructor.]

The future of a dairy herd depends upon the standard of the cows available to take the place of the discarded animals. The most practical way to improve the quality of a herd is to use bulls that can be obtained under Government subsidy, or herd book animals of good conformation, which are from high producing stock, and then to raise the heifer calves from the best cows.

The replacement of cows by purchase is not always successful. As a general rule owners are loath to dispose of their best animals, and if they can be induced to do so, the price asked is usually beyond the means of the average dairyman. Further, a large number of cows are under test, and generally the high producing animals are not for sale. Apart from this aspect, there is always the danger of introducing disease into the herd. The raising of calves to replace any vacancies and maintain the numerical strength of the herd is the safest and soundest practice.

Dairymen must recognise the fact that to rear an animal that will return a profit at the bucket and be a credit to its owner, it is essential to give the calf proper care and attention at birth and generous treatment until it reaches maturity. Too many calves are neglected during the first fortnight of their existence. In some instances they are weaned too early, and the failure of many cows can be traced back to this point. The unthrifty animal is generally indicative of bad treatment. The raising of calves which have had proper handling and care, so that they can stand the strain of high production in future years, is an important factor in reducing costs of production.

TREATMENT OF COWS.

It is essential that the cows should be kept in good condition and allowed at least six to eight weeks rest from the time of drying off until calving. Do not allow the cows to fall away into low condition during the last three months of the gestation period; probably the calf will not suffer so much as the cow, because of the ill effects upon her during her next lactation. Providing the cow has ample feed, &c., she requires very little attention, but it is advisable to administer a drench of ¾lb. to 1lb. of Epsom salts, 1 cup of treacle, and from 1oz. to 2ozs. of ground ginger in 1 quart of water the day before she is expected to calve. A similar drench is also recommended after calving.

WEANING.

A good deal of controversy centres around the question as to the most advantageous stage at which to remove the calf from its mother. Some dairymen favor doing this almost immediately after the calf has dropped, whilst others like the calf to run with the cow for one or two days. However, there is no disputing the fact that a calf nursed by its mother for two days receives a good start in life, but it should also be borne in mind that where this practice is adopted, the maternal instincts of the mother will have been aroused and the removal of the calf at this stage will cause the cow to fret and to hold back her milk for several milkings. This is most pronounced with a cow on her first calf, and the calf, as a rule, does not take so readily to drinking from the bucket. Probably the best results are obtained when the calf is removed from its dam after it has become firmly established on its legs—allowing a period not exceeding 12 hours. When a cow "comes in" with a congested udder this time may be extended. Calves which are weak, small, and unhealthy at birth are difficult to rear; they require extra attention and a longer feeding period, and, as a rule, cost more to raise.

TEACHING THE CALF TO DRINK.

Under natural conditions the calf obtains the milk at blood heat, it drinks frequently and in small quantities, so that the aim of the dairyman should be to imitate Nature as far as possible. The first milk secreted by the cow—the colostrum—is of vital importance to the newly born calf. When the calf drinks this the danger of various ills is lessened and mortality reduced. Its laxative effect cleans the digestive tract of fecal matter. Under ordinary circumstances the milk of the cow becomes normal within three to five days. The following table sets out the analyses of the colostrum and normal milk:—

	Colostrum.	Milk.
Water	71.69	87.00
Fat	3.37	4.00
Casein	4.83	2.85
Albumen	15.85	.40
Sugar	2.48	5.00
Ash	1.78	.75
	100.00	100.00

In the event of the colostrum not being available, the whites from six eggs mixed with ordinary milk and half a teaspoonful of castor oil will be found an excellent substitute. Give the full mixture at the first meal, and reduce it by the white of one egg at each subsequent meal until only one is given with the milk and oil, and continue giving this for five days.

Little difficulty should be experienced in teaching the calf to drink, providing patience and gentleness are exercised. Should the calf be stubborn and show no inclination to drink, leave it undisturbed until the next feed is due, during which time it will have become hungry and be more willing to drink.

The method commonly adopted is to place a couple of fingers into the mouth of the calf, and when the calf commences to suck the fingers gently lower its head into the bucket, taking care to avoid submerging the nostrils. If it continues to suck vigorously, the finger is gradually removed from the mouth, and the palm of the hand is kept just in front of the mouth. If the calf raises its head from the bucket and shows no desire to drink, it is only necessary to repeat the process previously outlined. Once the calf has learnt to drink the hand may be withdrawn from the bucket. If this fails, try putting a little milk into the mouth by means of the palm of the hand before inserting the fingers.

WHOLE MILK FEEDING.

The calf should receive whole milk for at least a fortnight, and be given its daily allowance in three meals for the first week. Calves that are at all weak should be fed four times each day, the temperature of the milk being from 95° to 98° F. The quantity required will vary with the different breeds, ranging approximately from 8lbs. to 12lbs. per day for the first fortnight. At no later period should more than 2galls. of milk a day be given to any calf.

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The following table can be taken as a guide as to the quantities of milk to feed to calves of varying weights:—

Calves weighing 55lb. to 75lb., 10lb. of milk daily at four to five weeks.

Calves weighing 75lb. to 100lb., 14lb. of milk daily at four to five weeks.

These amounts can be increased by 2lb. every two weeks until the calf is receiving from 18lb. to 20lb. of milk daily.

SEPARATOR MILK.

Although practically all the fat has been removed from the milk in the process of separation, yet it contains casein, albumen, and ash. The former two are the flesh-forming constituents of milk, whilst the functions of the proteids are to supply material for the formation of lean meat, blood, tendons, nerves, hair, and horns. The butterfat extracted from the milk is the energy-producing element of the food, and is stored in the body either as fat or is utilised in the system to produce heat and energy. Ash—being mainly in the form of phosphate of lime—makes it valuable for growing animals. Therefore, fat, being an energy food, the milk should be supplemented with carbonaceous or energy foods, rather than foods high in protein.

COMPOSITION OF WHOLE MILK AND SEPARATOR MILK.

	Whole Milk.	Separator Milk.
Water	87.00	90.55
Fat	4.00	.11
Proteids	3.25	3.39
Sugar	5.00	5.20
Ash	.75	.76
	100.00	100.00

Concentrates in various forms can be used to replace any loss of fat in the skim milk.

To ensure success in feeding separator milk it must be used when it is warm, sweet, and free from froth. At all times avoid the practice of feeding sweet skim milk when the preceding meal consisted of sour milk.

If sourness has developed, then feed sour milk all the time; do not constantly change from sour to sweet, and *vice versa*. There is no reason why the milk should not be always sweet, unless in the case of once a day separation.

LINSEED AND COD LIVER OIL.

The substitute for fat may be in the form of a reliable calf food which must contain a reasonable percentage of fat. Linseed in one form or another is in general use for calf feeding. Whole linseed is inclined to be rather too oily and only a moderate amount should be used, but the linseed meal which is the product after a large proportion of the oil has been extracted, can be used more liberally. This meal contains approximately 6 per cent. fat, 26 per cent. protein, and 38 per cent. carbohydrates.

If the linseed should tend to have a laxative influence, this may be corrected by the addition of a small quantity of flour. The flour will also supply some starch and produce a better balanced ration. Oatmeal may be used instead of flour.

Linseed meal at the rate of 1 tablespoonful at each meal, and gradually increased to 4ozs. per meal, until the calf is three months old, can be used to make good the fat deficiency in skim milk.

Commercial cod liver oil is used at the rate of 1 tablespoonful per meal and gradually increased to 1½ozs. to 2ozs. per meal.

In substituting skim milk for whole milk after the second week, the process should be gradual. If, for instance, the calf is receiving 10lbs. of milk each day, then commence adding separator milk at the rate of 1lb. of skim milk to 9lbs. of whole milk, and increase the amount 1lb. per day each day, so that by the tenth day a complete change over from whole to separator milk will have taken place.

METHODS OF FEEDING.

Feeding calves by means of a rubber teat which has a lead pipe attached, from which the milk is drawn from the bucket, is a practice which has been extensively adopted. By this method the calf receives its food in a more natural manner, and benefits by drinking more slowly than when fed from the bucket. It certainly entails more labor and requires more attention being paid to the cleanliness of the nipples and pipes, in addition to extra care at feeding time, for if the calf drains all the milk from the bucket, and the nipple is not removed, the continual sucking by the calf from the empty bucket results in air being sucked into the stomach. As a general rule the nipple is used for the first two to two and a half months, thereafter the calf is allowed to drink from the bucket.

For the purpose of feeding calves in this manner, it is necessary to erect miniature bails, in order that they may feed without interference from one another. In fact, it can be safely said that the most satisfactory method of feeding calves is per the medium of bails.

Calves at Lucerne Rack. Note shelter shed at top left.

Tied up Calves.

Quite a number of dairymen who do not run a large herd of cows adopt this method of rearing their calves. It has proved successful when the calves have clean surroundings, good shed accommodation, and given facilities for plenty of exercise. Unfortunately, however, there is the tendency when this plan is followed to forget that the calf is tethered, and often the surroundings are not as sanitary as they might be. Exercise is necessary for the good health and development of the animals. The method under discussion, however, has one distinct advantage, the person in charge of the calves is able to regulate the amount of milk required by each calf.

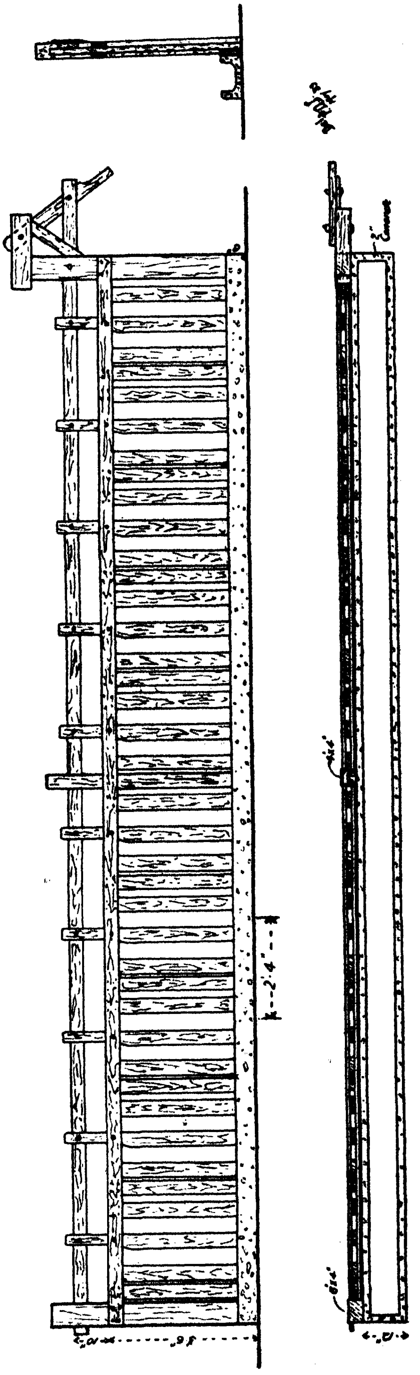
Trough Feeding.

As the heading suggests, this method provides for feeding a number of calves at the same time, and in most cases little thought is given to the different sizes of the calves. It usually causes the calves to gulp their food, and the stronger animals generally fare much better than their less fortunate. Further, it must be remembered that some calves drink more quickly than others.

— CALF BAILS —

TO ACCOMMODATE 10 CALVES.

Total length 24′6″
From centre to centre of bail 2′4″



A little forethought should be sufficient to convince any one handling calves that this method of feeding cannot hope to produce the same results as where the calves are not bunted about and are allowed to feed in peace.

SEPARATE BUCKETS AND MINIATURE BAILS.

Probably no system of calf feeding answers so well as miniature bails. Partitions are not absolutely essential. When several are being fed it certainly is an advantage to have the bails so constructed that all the calves can be bailed or released at the one operation of a lever. The bails should be 3ft. 6in. to 4ft. high, and 4½in. wide in the opening to take the neck, with sufficient space between each bail to allow the calf to stand in comfort, generally 2ft. 4in. between the centres of the bails.

In front of the bails—instead of a continuous trough—is affixed a platform, or stationary shelf. If buckets are used as receptacles for the milk, a hole—large enough to take sufficient of the bucket to prevent it from being upset—should be cut in the platform. If petrol or kerosene tins (which have been cut down) are used, see that all seams are soldered, and arrange the tin in front of each calf in such a manner that it cannot be turned over.

If calves fed on this principle are allowed to remain in the bails for a short period after each meal, it will go a long way towards the prevention of the habit of them sucking one another, more especially if a small quantity of grain is put in the bucket after the milk has been drunk. If the latter is done, it will also encourage the calves to eat.

FEEDING WHEY.

Whey which has been pasteurised, and is in good condition, is capable of producing strong and healthy calves if fed in conjunction with other foods.

The composition of whey is as follows:—

Water	93.91
Fat	.35
Casein	.10
Milk and sugar	4.60
Albumen	.39
Ash	.65
	100.00

Whey is deficient in protein, and, therefore, requires nitrogenous matter to replace that which was lost during the process of cheese making. It contains a high percentage of milk sugar, which is a valuable food stuff. It should not be fed, however, until the calves have made a good start on milk; preferably four to five weeks after birth.

The protein deficiency may be rectified by the addition of meat meal which is free from fibre and contains 55 per cent. of protein. It may be fed at the rate of 2ozs. daily at the fourth week, 3ozs. to 3½ozs. daily at the fifth week, 5ozs. daily at the sixth week, 7ozs. to 8ozs. daily at the seventh week.

If the feeding ration contains a proportion of milk then the quantity of meat meal should be reduced accordingly. Linseed meal can also be used to make good any shortage of protein by adding ½lb. to each 1gall. of whey.

MILK SUBSTITUTES.

In substituting any prepared food for milk, it is essential that the change over from one form of feeding to the other be gradual. The ration should contain at least a proportion of milk for the first five or six weeks. The rate of change should be the same as with milk. The addition of too much meal at the commencement of feeding the new ration may probably cause digestive disorders, and should this occur, it will be necessary to revert to the half milk ration until the trouble is corrected.

Scours and lack of vigor are frequently characteristic of calves raised on meals. However, as they grow older they appear to overcome these temporary set backs. The average farmer is not inclined to devote too much time to the preparation of the various foods.

Calves should be encouraged to eat grain and chaff at an early age, and at the age of three to four weeks they will, if given the opportunity, readily take to these forms of fodder. They require about ½lb. of grain mixture of oats and bran when four to six weeks old, 1lb. at six to eight weeks, and 2lbs. when three months old, fed in conjunction with chaff.

Grain rations are principally made from maize, barley, oats, bran, linseed meal, and mineral matter, such as 200lbs. crushed barley, 150lbs. crushed oats, 150lbs. bran, 50lbs. linseed meal, 3lbs. to 4lbs. bone flour, 3lbs. salt.

Should the chaff or hay be non-leguminous, then the protein content of the mixture must be increased by reducing the amount of barley and oats and increasing the proportion of linseed meal.

The following table sets out the foods high in protein and carbohydrates:—

PROTEIN FOODS.

Concentrates—	Roughages—
Linseed meal	Lucerne
Cocoanut oil cake	Clover hay

CARBOHYDRATE FOODS.

Concentrates—	Roughages—
Maize	Grass hay
Oats	Oaten and wheaten chaff
Barley	Oaten and wheaten straw
Rye	Maize silage
	Sorghum silage
	Roots

BY-PRODUCTS.

Protein.

Dried blood. Meat meal.

The calves should have access to good quality lucerne or clover hay. These fodders are rich in protein and mineral matter, both of which are needed to promote growth and sustain bodily health.

CALF MEALS.

Most of the home-made calf meals consist of maize meal, oatmeal, linseed meal, wheat flour, and blood flour. For example, a meal consisting of 50lbs. oatmeal, 20lbs. maize meal, 75lbs. linseed meal, 2lbs. wheat flour, 3lbs. dried flour will contain:—

	Dry Matter.	Protein.	Carbo-hydrates.	Fat.
50lb. oatmeal	46.05	5.75	26.05	2.95
20lb. maize meal	17.82	1.58	13.34	.86
75lb. linseed meal	66.82	19.57	28.87	3.37
2lb. wheat flour	1.75	.16	1.25	.01
3lb. dried blood	2.74	1.56	—	.07
150lb. Totals	135.18	28.62	69.51	7.26

This has a nutritive ratio of 1 to 3. One pound of this mixture compared with 1gall. of separator milk is as under:—

	Dry Matter.	Protein.	Carbo-hydrates.	Fat.
1gall. separator milk	.94	.33	.52	.01
1lb. mixture	.90	.19	.46	.04

Thus in a daily ration there will be:—

	Dry Matter.	Protein.	Carbo-hydrates.	Fat.
2galls. separator milk	1.88	.66	1.04	.02
2lb. mixture	1.80	.38	.92	.08

The separator milk has a nutritive ratio of 1 to 1.16 and, as mentioned above, the mixture is 1 to 3. While the mixture is better balanced than the separator milk, it is deficient in digestible nutrients. Henry quotes "that a calf two to three months old, weighing 150lbs., requires 3.4lbs. of dry matter in which the digestible nutrients are .6 protein, 1.95 carbohydrates, and .3 fat, and having a ratio of 1 to 4.5. Therefore, the deficiency in the mixture would have to be made up by feeding grain mixtures and fodders."

The former is prepared for use by adding sufficient lukewarm water to the requisite amount of meal and stirring until it is free from lumps. Boiling water is then added at the rate of 8lbs. to every 1lb. of meal. It may be heated to 145° F., then reduced to 95° to 98° F., then fed to the calves. Should only a small quantity of milk be available, prepare a mixture in the proportions of eight parts of oatmeal or ground oats to one part of linseed meal. After the mixture has been prepared into a gruel, the oat husks, when crushed or ground, are strained off with a sieve. The young calf does not require too much fibre, but this, however, may be a useful food for older animals.

WEANING OFF MILK.

Providing the calf has made satisfactory development, it may be weaned off the milk ration when from four to four and a half months old by omitting one meal each day and gradually reducing the amount until the milk is entirely eliminated, *i.e.*, at five to five and a half months.

The time of weaning will largely depend on the quantity of milk available and the condition of the animals. Calves which are fed on milk substitutes should be weaned in a similar manner.

It frequently happens that they are given reasonable care and attention until they reach the weaning age, and then they are turned out and left to fend for themselves. This is a mistake. It is desirable that they be fed cheaply, but it is imperative that the heifer, which will ultimately be used for breeding, should not receive any check in growth and be maintained in a strong and vigorous condition.

FODDERS.

ENSILAGE.

It is not advisable to commence feeding silage until after the third month, because its inclusion widens the ration.

GRASS.

Too many breeders of livestock hold the opinion that grass is a perfectly balanced ration. It contains from 75 to 80 per cent. of water, and the young calf is incapable of handling a sufficient quantity of grass to maintain normal growth. The calves should not be expected to depend on grass alone for their food, but should have in addition a regular supply of grain, especially as a calf requires a narrower ration than a cow.

SALT.

The importance of salt as a part of the feeding ration is now definitely recognised. It may be fed by adding a pinch at each meal, at the rate of 1lb. to each 100lbs. of concentrates, or by supplying it in the form of rock salt to lick.

SCOURS.

By far the most common ailment of calves is scours—an extreme looseness of the bowels. It appears either in the common or infectious form.

The former is due to digestive disturbances and may be caused by over-feeding, variations in temperatures, feeding alternately sweet and sour milk, too large a quantity of fat substitute, changing diet too rapidly, and last, but by no means least, through allowing the calves to drink out of dirty utensils. It is easier to prevent this trouble than cure it.

Too often when scours occur there is a desire to check the disorder immediately and astringents are administered, which have a binding effect, *whereas it is most important that the bowels should be purged to get rid of the trouble.* Nothing is better for this purpose than castor oil given in doses of 1oz. to 3ozs. Cut down the ration to half the usual quantity, and if the calf is under six weeks old, supply whole milk and give three to four drops of formalin to each 1 quart of milk. Another treatment, which can be recommended, is doses of tincture of iodine at the rate of three to four drops in four tablespoonfuls of water three times daily.

Periodically supply the calves with lime water; it assists in checking the onset of scours and supplies mineral matter to the ration—from one tablespoonful for a young calf and 2ozs. to 3ozs. for a larger animal at each meal. It will probably be found more convenient to give lime water once or twice during the week.

Infectious or white scours is a bacterial disease, generally making its appearance at the birth of the calf or immediately afterwards. The germs gain entrance to the body through the navel cord, and the only safe preventive is to tie the cord at birth and apply a mild disinfectant.

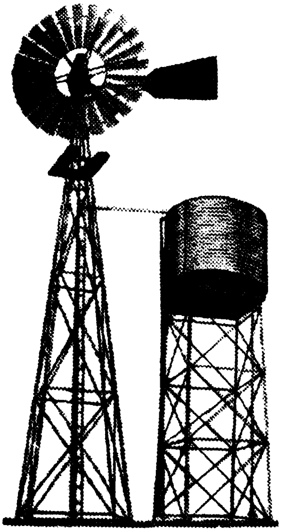
SUMMARY.

1. Remove the calf within 12 hours of being dropped.
2. Feed for the first five days on its mother's milk.
3. The first week feed three times a day and subsequently twice a day.
4. Supply whole milk for at least two weeks.
5. Make the substitution from whole to separated milk gradually, preferably taking 10 days to effect a complete change over.
6. Add a suitable concentrate to the separated milk to replace the loss of fat.
7. Remove the froth from the separated milk before feeding.
8. Always feed the milk for the first three months at a temperature from 95° to 98° F., and thereafter slightly lower, but not cold.
9. Feed milk or a milk substitute ration for 4½ to 5½ months—once daily after 4½ months.
10. Supply grain, chaff, &c., after the third week.
11. Supply lime water to the ration periodically.
12. See that the calves have access to an abundance of clean drinking water.
13. Do not forget that salt is an essential part of the ration.
14. Allow plenty of exercise.
15. On no account over-feed.
16. Cleanliness is absolutely essential; pay strict attention to utensils, sheds, and yards.
17. Make adequate provision for shelter and sleeping quarters for the cold weather.
18. The three essential points to observe are: Keep the calves healthy, supply a sufficient and suitable ration, and handle the stock intelligently.

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow October to April.	Per Herd during April.	Per Cow during April.	Per Cow October to April.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	36	26·93	13,623	378·42	3,817·15	712·03	19·78	196·98	5·23
5/D .	30	15·83	8,586½	286·22	3,657·04	483·84	16·13	199·32	5·63
5/E .	40·47	26·53	10,282	254·06	3,111·21	516·33	12·76	166·76	5·02
5/P .	31·67	25·53	17,764	560·91	3,996·75	936·33	29·57	199·30	5·27
5/R .	70	37·40	8,718½	124·55	2,326·58	387·01	5·53	97·02	4·44
5/S ..	18	12·73	5,114	284·11	2,539·84	258·18	14·34	124·61	5·05
5/Y .	26	20·37	8,030½	308·86	3,642·84	469·55	18·06	191·80	5·85
5/Z ..	37·90	35·37	26,180½	690·78	4,601·25	1,331·59	35·13	221·93	5·09
5/Ee	19	15·37	5,595½	294·50	4,625·42	337·33	17·75	233·27	6·03
5/Gg	22·63	17·33	5,457	241·14	2,512·89	268·38	11·86	121·14	4·92
5/Ii .	31	25·40	10,796	348·26	3,915·93	616·93	19·90	195·67	5·71
5/Jj .	23·90	12·10	4,994	208·95	3,742·79	244·03	10·21	164·43	4·89
5/Kk	21	18·77	8,433	401·57	3,281·78	388·17	18·48	149·48	4·60
5/Nn.	26·60	16·43	6,288	236·39	4,059·91	299·30	11·25	191·31	4·76
5/Oo	21	16·17	5,765	274·52	3,726·73	266·26	12·68	170·10	4·62
5/Oq	20·40	16·87	9,795½	480·17	3,248·25	566·91	27·79	179·20	5·79
5/Rr	23·40	19·47	7,248½	309·76	2,195·88	361·51	15·45	123·42	4·99
5/Ss .	21·03	10·13	3,986½	189·56	3,373·05	194·42	9·24	156·48	4·88
5/Tt	12	10·33	4,315	359·58	3,970·46	220·19	18·35	205·82	5·10
5/Uu.	22	20	7,440	338·18	2,967·70	331·45	15·07	134·76	4·45
5/Vv	24·50	22·93	20,635½	842·26	3,872·40	847·61	34·60	170·80	4·11
Means	27·55	20·09	9,478·50	344·08	3,413·63	477·97	17·35	167·06	5·04



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THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow July to April.	Per Herd during April.	Per Cow during April.	Per Cow July to April.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E .	27	21·03	9,877½	365·83	5,762·37	372·28	13·79	233·30	3·77
7/H .	9	7·40	4,416	490·67	5,824·47	211·80	23·53	293·13	4·80
7/K .	19·37	12·57	10,522½	543·24	7,167·44	412·53	21·30	295·10	3·92
7/L .	36·40	23·73	13,316½	365·84	5,856·38	633·69	17·41	276·31	4·76
7/T .	14	11·70	3,300	235·71	4,689·01	161·68	11·55	216·01	4·90
7/W .	19	15·70	8,332½	438·55	6,293·42	348·28	18·33	263·63	4·18
7/Y .	27	16·50	7,935	293·89	5,585·26	349·59	12·95	261·37	4·41
7/Aa	14	10	2,700	192·86	4,711·71	153·46	10·96	231·47	5·68
7/Hh	18	11	4,493	249·61	5,002·40	202·70	11·26	218·43	4·51
7/Kk	19	17·03	7,932	417·47	6,308·73	345·69	18·19	267·71	4·36
7/Mm	37	28·30	11,846	320·16	6,689·45	484·27	13·09	262·35	4·09
7/Nn.	24	14·97	6,170	257·08	6,034·93	247·01	10·29	237·70	4·00
7/Oo	16	13·80	8,551	534·44	6,375·08	434·51	27·16	303·72	5·08
7/Pp	19	15·97	7,059	371·53	6,249·01	384·96	20·26	337·36	5·45
7/Qq	17	15·77	7,409	435·82	4,972·69	443·69	26·10	280·53	5·99
7/Tt	19·90	18·17	10,825½	543·99	6,362·82	486·71	24·46	285·00	4·50
/Uu	23·40	17·27	4,585	195·94	5,052·99	229·72	9·82	230·78	5·01
7/Vv	14	10·10	5,274½	376·75	6,406·18	267·13	19·08	315·73	5·06
7/Xx	22	19·53	11,135	506·13	7,040·36	586·79	26·67	386·28	5·27
7/Yy.	22	20	7,950	361·36	4,830·26	371·36	16·88	217·06	4·67
7/P .	17·47	7·77	6,268	358·78	—	288·53	16·52	—	4·60
Means	20·69	15·63	7,614·19	367·97	5,826·73	353·16	17·07	265·10	4·64

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR APRIL, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during April.	Per Cow during April.	Per Cow December to April.	Per Herd during April.	Per Cow during April.	Per Cow December to April.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B .	19	11·47	5,132	270·11	1,585·62	244·76	12·88	75·30	4·77
6/C ..	19·67	12·63	6,879½	349·74	2,621·86	330·00	16·78	119·84	4·80
6/F .	23·27	13·17	12,965½	557·17	2,510·59	628·83	27·02	128·53	4·85
6/H .	26	12·07	7,545½	290·21	2,228·17	376·79	14·49	111·14	4·99
6/Y .	12·70	8·90	3,036	239·05	2,194·15	140·58	11·07	98·30	4·63
6/Ii .	30·97	27·07	18,127	585·31	3,233·61	769·45	24·84	188·33	4·24
6/Ll	22·63	18·70	13,177	582·42	2,966·43	487·57	21·56	115·41	3·70
6/Oo	19·33	18·40	15,043	778·22	4,392·58	703·03	36·37	196·87	4·67
6/Pp	15	13·17	8,291½	552·77	2,507·57	438·41	29·23	123·60	5·29
6/Qq	24	20·97	14,424	601·00	4,216·16	638·34	26·60	181·36	4·43
6/Rr	29	23·97	13,308	458·90	3,725·11	593·80	20·48	160·73	4·46
6/Tt	21·13	16·57	10,428	493·51	3,255·86	472·75	22·37	145·14	4·53
6/Zz .	27·13	22·23	15,494½	571·12	3,542·86	741·02	27·31	158·24	4·78
6/Xx	21·80	20·53	14,196½	651·21	3,490·94	652·07	29·91	147·89	4·59
6/Yy.	30·97	24·80	12,264	395·99	2,265·75	646·97	20·89	115·27	5·28
6/Vv	21	14·90	9,371	446·24	3,581·66	460·68	21·94	168·95	4·92
6/Aaa	20·53	4·43	1,706½	82·57	999·99	95·67	4·63	55·79	5·53
6/Bbb	28·57	26·03	19,098	668·46	3,664·56	772·01	27·02	148·64	4·04
6/Ccc	20·97	18·97	10,851½	534·25	3,245·36	476·57	23·46	137·11	4·42
6/Ddd	23·33	21·30	12,689	543·89	3,468·85	573·53	24·58	151·55	4·52
6/Eee	28·93	23·60	19,163	662·39	4,128·08	862·73	29·82	174·10	4·50
6/Fff	27	21·37	17,189	636·63	3,854·35	723·05	26·78	162·11	4·21
6/Ggg	26·07	24·40	20,368	781·28	4,350·80	801·97	30·76	174·72	3·55
Means	23·43	18·25	12,206·43	520·87	3,169·68	549·15	23·43	140·11	4·50

FUTURE OF PIG-RAISING IN SOUTH AUSTRALIA.

PIGS SUITABLE FOR EXPORT—CHANGE OF TYPE ESSENTIAL.

[By W. J. Spafford, Deputy Director of Agriculture.]

In South Australia the position has been reached where the breeding and rearing of so many pigs have increased numbers to such an extent that local markets cannot absorb the animals, and consequently prices are extremely low. The way out is to export pig carcases to Great Britain, which country imports from £50,000,000 to £60,000,000 worth of pig-products every year, and of importance to us is the fact that the great bulk of these are sent from foreign countries. It has been proved definitely that first-class bacon can be manufactured in Britain from carcases received in a frozen state from Australia, provided that they are of the right type, and that the pork from frozen porkers thaws out well and sells readily, and so it should be possible to secure a share of this enormous trade in pig-products. To be able to do this profitably it will be necessary to produce the type of pig welcomed by British buyers, and not to expect the consumers to pay high prices for something they are not at all keen on, and which is consequently unsuitable for the trade. That they will not do this is amply illustrated by what happened a few weeks ago to a consignment of a thousand South Australian pig-carcases sold in London on behalf of a local exporter, in which case the carcases of the required type brought 5½d. per pound, whilst others of the same weight, but carrying much too much fat, realised the low price of 2¾d. per pound.

Change in Fashion.

It was only a few years ago when the term "British pork" meant "fat pork," but that has been changed, and now-a-days the high-priced bacon and pork eagerly sought for in the British markets is of a very lean type, and anything showing much fat is sold at a really low price. In this direction public taste has become very fastidious in favor of lean pork and bacon and if South Australia is to secure a place in this wonderful market it will be necessary to produce an article of the type required.

Although the change from the attraction of very fat pig-products to a fancy for lean pork and bacon came about many years ago in Great Britain the tradition has persisted in this country that the ideal pig was a short, dumpy animal, broad of back, round and heavy in the hams, and carrying a relatively high proportion of fat, and it is only in the last few months, when the local market has been heavily overloaded by supplies, that a noticeable change has taken place. Present-day sales show a strong preference for the properly finished lean type of porker and baconer, and whilst free choice is possible, because of excessive numbers offering, nearly twice as much per pound is paid for long-bodied, deep-sided pigs, which a year or so ago would have been considered to be in forward store condition only, than is given for animals of equal weight but carrying the amount of fat that was looked for fairly recently.

Although it is *important* to send pigs to local markets in this "forward-store" condition if it is hoped to obtain anywhere nearly top prices, it is *essential*, to produce this type of pig if any appreciable numbers of carcases are to be successfully marketed in Great Britain.

To suit the requirements of the British market the type of pig and the condition carried are similar whether for the porker or baconer trade, the only difference being that of weight of carcase, and this type is described in the recent publications on the subject of the *British Ministry of Agriculture and Fisheries* as:—

Head with jowl and neck should be light. This portion consists largely of bone and is therefore of low value, and on that account requires to be light, and should not carry rolls of coarse fat at jowl or over the neck.

Shoulders and fore-end must be light and free from wrinkles and coarseness. The "collar" containing overlapping muscles and much gristle is a cheap cut.

Back must be long and level, because the middle of the carcase fetches the highest price per pound. Length means quantity of the most valuable portion, and a level back means weight and depth of loin. The fat on the back should not exceed 1½in. in thickness in baconers, and should be considerably less in porkers.

Sides should be level and moderately deep. Distension of the lower part is often accompanied by thin belly cuts, and disproportionate primary offals. Moderately deep sides afford good depth of prime back cuts and under cuts.

Underline must be straight as it denotes that the "thin streaky" and "flank" cuts are not unduly distended and thin.

Belly should be thick in the flesh, as the value of lower cuts is increased by thickness.

Flank should be thick, handle firm, and be in line with the sides.

Hams must be broad, wide, and deep to hocks, as these characteristics denote plenty of flesh. There should be no depression between the hams at the root of the tail, as this indicates excessive fat.

Tail should be set high as it is held that it denotes a higher proportion of flesh than if set low; on the other hand a tail set too high frequently denotes an excess of back fat.

Legs should be set wide apart, and the pig should stand well up on the tips of the toes.

Bone must be fine, as it indicates quality and does not detract from weight.

Skin should be free from coarseness and wrinkles.

Hair should be fine.

Color may be anything, but the trade prefers white pigs.

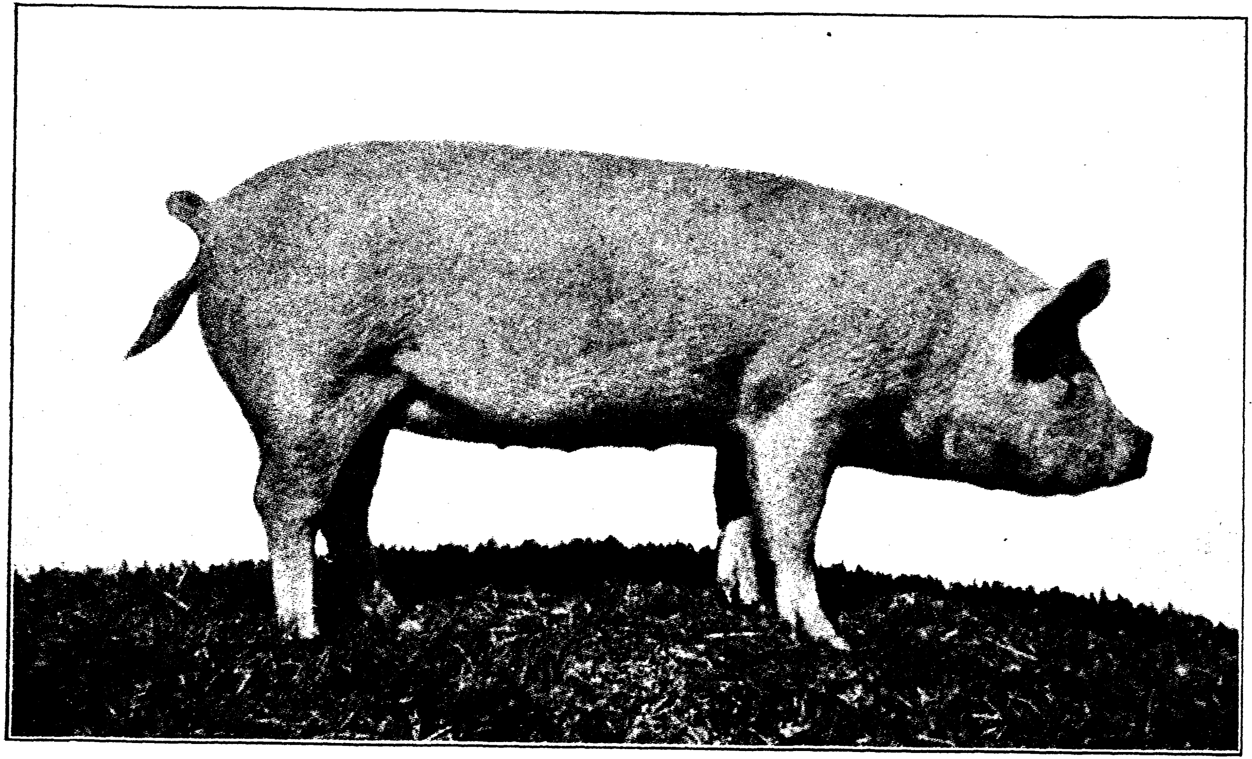
Weights should range between 160lbs. to 225lbs. live weight (120lbs. to 170lbs. dressed weight) for baconers, and 85lbs. to 120lbs. live weight (60lbs. to 90lbs. dressed weight) for porkers.

Good conformation does not necessarily connote good quality of meat, which is largely dependent upon feeding. Breeding exerts the greater influence on general conformation, and feeding on the quality of the flesh. Feeding determines the color and texture of the flesh, and to some extent the quality of the bone.

LEAN BACON AND PORK NOW POPULAR.

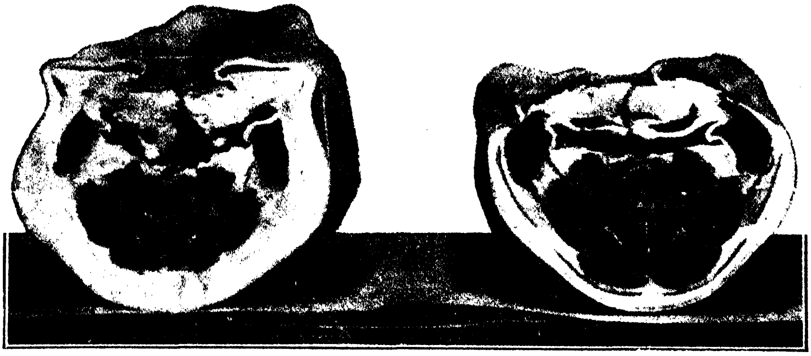
The fat bacon and pork, which had ready sale in Great Britain a few years ago, is only saleable at low prices at present, for fashion has changed towards a well-finished pig of a very lean type, similar to what we have looked upon as a "forward store."

Supplement to the "Journal of Agriculture."]



From "Bacon Hog and Hog Grading," by A. A. Macmillan.

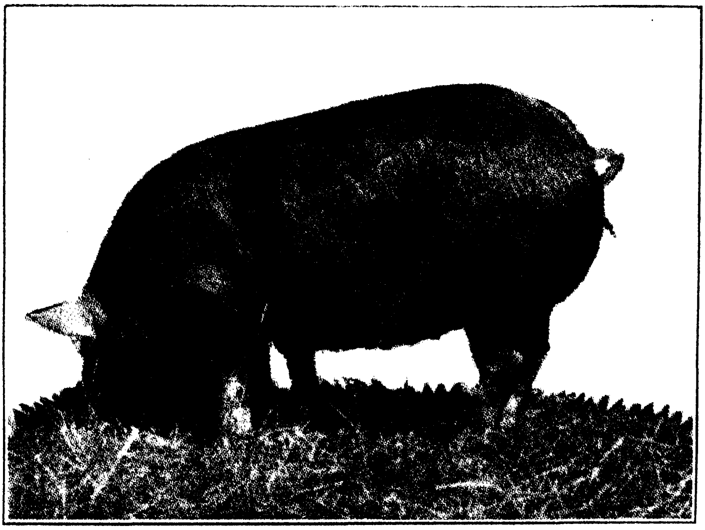
IDEAL PIG FOR PRESENT-DAY MARKET REQUIREMENTS.



From "The Pig Industry," by R. B. Kelley.

LEAN MEAT PREFERRED.

The illustration on the right shows the high proportion of lean to fat desired to-day, whilst that on the left shows the once popular quality which is now considered to be much too fat and so is of low market value.



OUT-OF-FASHION TYPE OF MARKET PIG.

The short, dumpy pig, broad of back, round and heavy in the hams, and carrying a relatively high proportion of fat, no longer sells well in either British or local markets.

The accompanying illustration of the Ideal Pig fulfils all the requirements of both the British and local markets, and if we are to capture a noticeable share of the overseas trade in pig products we must breed and rear pigs of this type in large numbers.

DEFECTS COMMONLY FOUND IN CARCASES.

The defects which are most common in carcases received by English bacon factories and butchers are as follows:—

Short Middle.—Great differences are found in the length of side, and it is not unusual for sides of the same weight to vary 4in. or even more in the measurement taken from top of the first rib to the end of the round bone. The proportion of the valuable middle cuts is much greater in the longer sides, and the shorter sides are heavier in the shoulder and carry thick back-fat.

Excess of Fat.—Sides which contain heavy excess of back-fat are almost unsaleable. If the back-fat is thick the whole of the carcase is similarly affected.

Soft Fat.—The presence of soft fat is usually an indication of wrong feeding methods. Many distributors hold that the solidity of the fat is a conclusive test of quality, and that the belly-fat affords a better test than the back-fat.

If the fat is firm and white, the bacon made will be of the highest quality.

Heavy Shoulders.—A coarse framework of bone at the shoulder, with its accompanying weight of flesh, and particularly if accentuated by too much fat makes its sale very difficult.

Thin Belly.—Unduly distended bellies are so stretched that the rashers cut from "flank" and "thin streaky" are excessively narrow.

Seedy-cut.—Seedy-cut, which is a pigmentation about the milk ducts, is usually found in the female progeny of black boars; it is not in itself harmful, but, owing to its objectionable appearance, the parts affected must be removed from the side before sale. Apart from disfiguration, this may mean the removal of 7lbs. or 8lbs. of bacon from a valuable portion of the side. Seedy-cut can be avoided by using a white boar.

RECOMMENDATIONS.

If South Australia is ever to become the important pig-breeding country its natural advantages of favorable climate and plentiful supply of suitable grain appear to indicate, pig carcases must be exported to Great Britain.

If the British market for pig-products is to be successfully exploited only the very best quality of carcases must be exported.

To produce the type of carcase required in Great Britain, breeders must realise that the type of animal that has been generally popular until quite recently, and is still so with most pig-keepers, must be replaced by a different-shaped animal. Short, dumpy, fat pigs are of low value in Britain, and at present prices are unprofitable to export.

The type of pig which brings top market prices overseas is a long, lean, rangy animal, deep in the side, light in the head, neck, and shoulders, straight on the underline, with well developed hams, of a white color, and in a condition which is generally looked upon in this country as *forward store condition.*

The right condition is developed by careful feeding, and is particularly helped by allowing the youngsters plenty of freedom and exercise until they are getting close to marketing weight. Leanness resulting from under-feeding is not the kind of condition desired.

The great bulk of the pig carcases imported by Britain for which top prices are secured are sired by Large White boars, and there is no breed so suitable as sires for this purpose, because of the high proportion of animals of correct type got by them.

Almost any prolific, roomy sow is suitable to mate with a Large White boar to produce pigs which will grow into export animals if fed correctly, but of the sows usually available in this country the order of preference would be something like:—

(1) Half-bred Tamworth x Mid York.
(2) Half-bred Tamworth x Berkshire.
(3) Half-bred Large White x Mid York.
(4) Half-bred Large White x Berkskhire.
(5) Tamworth.
(6) Large White.
(7) Canadian Berkshire.
(8) Half-bred Berkshire x Mid York.
(9) Mid York.
(10) Berkshire.

HISTORY OF WOOL PRODUCTION IN SOUTH AUSTRALIA.

[By R. C. SCOTT, R.D.A., Supervisor of Experimental Work.]

There is no clear record of the sheep introduced into South Australia prior to the foundation of the State. It is known that several vessels bringing stores to the Colony also brought small consignments of sheep but there is no note of the breeds or the purposes for which these animals were used. However, the probability is that they were largely used for human consumption and had little influence on the breeding flocks ultimately built up.

In 1836 the South Australian Company imported Merino rams and ewes from Saxony, whilst in the same year Merinos were introduced from South Africa and Southdowns and Leicesters from England. Another important importation which must have had considerable influence on the foundation stock was a line of several thousand Saxon merinos purchased in Tasmania by the South Australian Company. The Company were familiar with the origin of this flock and when the opportunity offered purchased their requirements at a price of 30s. per head. Unfortunately, the vessels carrying the sheep to Adelaide encountered very rough weather and almost 2,000 were lost on the voyage. The overland route between New South Wales and South Australia was made practicable at about this time and consequently a number of sheep were introduced from that State. The experience of New South Wales was of great assistance in indicating the class of sheep on which it would be best to concentrate. The suitability of the Merino and the necessity for wool production were quickly recognised and therefore this breed was universally adopted throughout the State.

From time to time further importations were made from New South Wales, Tasmania, and South Africa, and together with careful selection of observant stud masters the South Australian type of Merino was built up. This type became famed throughout the Commonwealth for its large frame, strong constitution, plain body, and heavy fleece, whilst as sheep raising extended from within the vicinity of Adelaide to the lower rainfall pastoral areas the suitability of this class of Merino became more and more evident.

The numbers quickly increased from about 5,000 in 1837 to 28,000 in 1838 and to 250,000 in 1841. In the latter year several owners possessed flocks of over 10,000 sheep whilst one owned rather more than 20,000.

Wool was first exported from South Australia in 1837 when four bales were shipped to England. In August of the following year another small consignment was forwarded, followed by 800 bales in 1839. However, in 1841 the wool exports totalled 641,825lbs., valued at £35,486, which must be considered an excellent achievement for any Colony to attain in five years after its foundation. In the following table the development of the wool industry in South Australia is shown:—

Period.	Number of Sheep.	Wool Exported. lbs.	Value. £
1841	250,080	641,825	35,000
1846	681,374	2,042,195	107,000
1851	1,250,000	3,694,672	148,000
1856	1,962,460	8,236,221	412,000
1861	3,038,356	13,164,391	623,000
1866-70	4,442,738	24,184,079	1,025,000
1871-75	5,445,953	34,956,900	1,607,000
1876-80	6,240,887	45,337,334	1,761,000
1881-85	6,619,199	44,430,686	1,678,000
1886-90	6,572,331	42,774,114	1,411,000
1891-95	6,962,069	49,677,503	1,419,000
1896-1900	5,454,331	37,901,743	1,137,000
1901-05	5,457,918	37,859,099	1,255,000
1906-10	6,610,509	47,786,798	1,810,000
1911-15	4,921,704	39,535,042	1,454,000
1916-20	5,987,638	40,930,551	2,631,000
1921-25	6,465,759	53,817,883	4,031,000
1926-30	6,814,650	63,504,923	3,990,000

(The figures quoted in quinquennial periods are annual averages.)

The sheep flocks were rapidly built up until about 1870 since which time they have not fluctuated very widely except for the losses caused by drought. However, it will be noticed that whilst the numbers have not increased the yield of wool has improved and in recent years considerable attention has been given to the improvement of both the quality and quantity of wool obtained.

In the early years of wool production the material was shipped overseas and sold in England, but about the year 1860 wool-buyers commenced to visit Australia and to purchase their requirements on the spot. This necessitated the classing of the fleece so that each could secure the special type of wool required. Consequently the classing of the wool prior to submitting for sale became generally adopted and in that way improved prices were secured. To-day practically all wool is sold in Australia and only a small proportion shipped overseas prior to purchase. Each year a series of sales is arranged when the wool submitted can be examined by buyers on the floors of the wool stores. On the day arranged this wool is offered by auction according to the catalogued number and in that way a large number of classes are quickly disposed of.

Apart from the introduction of machine shears little alteration in the wool raising industry has taken place in recent years, although to-day pests such as rabbits, blowflies, etc., command serious attention.

STRAWBERRY CULTURE.

[By E. LEISHMAN, R.D.A., District Horticultural Instructor.]

The majority of strawberries in this State are grown in the Mount Lofty Ranges, and mostly on the higher slopes. In the cooler parts the orchardists grow strawberries as a side crop between the young trees and are generally left until they become unproductive or the trees requiring the entire space. This berry is easily grown, given the conditions and attention, and a small area can be very remunerative if under intense culture.

The commercial strawberry grower must bear in mind the following points in establishing a plantation:—First, accessibility of markets; second, transport; third, labor supply.

SOIL.

The strawberry has a wide range of soils and may be grown successfully on almost any type of soil, provided that it is well supplied with moisture, and at the same time well drained. A sandy loam with a clay subsoil is the most suitable. The various varieties of strawberries show decided differences in behavior on different soils. Some are better suited to clay or heavy soils, while others are adapted to sandy or light soils. For profitable production soils must contain plenty of humus. It is essential to have a plentiful supply of moisture throughout the growing period. Good cultivation is very necessary for the success of growing strawberries.

SITE AND PREPARATION OF LAND.

It is desirable to select a slope which will get as much of the morning sun as possible, but there are numbers of good strawberry beds facing all aspects. The general practice in the hills is to prepare the land for an orchard and grow the strawberries between the rows. The land should be well broken up from 8in. to 10in. deep, and a cultivated crop of peas or root crops be planted for a year or two. If the soil is lacking in humus a good coating of stable manure, or the ploughing in of a cover crop is necessary.

METHOD OF PLANTING.

Practically all of the strawberry gardens are worked by hand. The method of planting in vogue is the single, and, to a lesser extent, matted rows. Where the beds are not irrigated single rows are preferred, as constant cultivation can be applied around the plant. The usual distance for planting the single rows is 2ft. apart, with the plants set from 10in. to 15in. in the rows. Matted rows can be planted in the same way, and allow all or a part of the runners to spread between the original plants, the width of the mat can be regulated with the hoe. Where there is danger of injury from white grubs, causing a loss of plants, the matted system could be recommended, as although some plants are killed, enough will survive to produce a good yield.

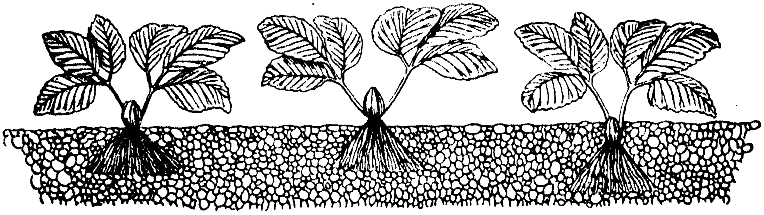
The number of plants required for an acre for single row 2ft. x 12in. is 21,780; 2ft. x 10in., 26,136.

SETTING THE PLANTS.

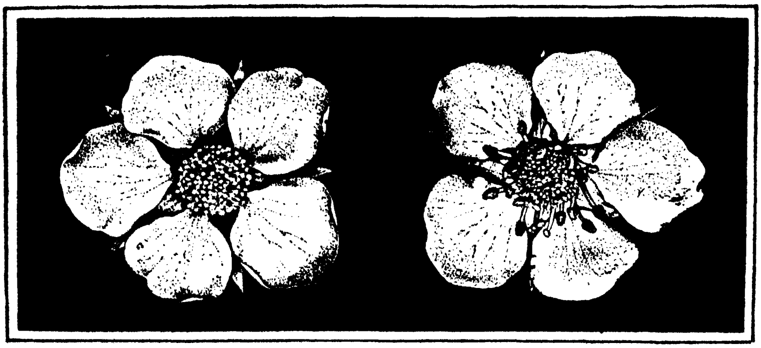
The plants are usually set with the hand, scooping out a hole or using a dibble, trowel, or spade. A wire or a strong cord is suitable for marking out the rows, as straight rows look well and are easy to cultivate. Choose good healthy runners; if the roots are too long, cut them off to 2in. or 3in. in length. Spread the roots evenly when planting, and leave the crown of the plant just above ground level. Planting can be carried out from May to August, the most popular time is in the autumn.

VARIETIES.

In selecting varieties of strawberries it is well to choose those suited for the purpose for which they are to be grown, and especially adapted to the particular soil and climate. The experience of growers in the district is the best guide. Color and texture are very important factors for marketing; a bright pinky-red, or a bright deep-red is the most popular fancy. A very dark dull red color or light color berries count against their marketing qualities. A good texture berry will hold its appearance well for several days. Strawberry varieties in cultivation have two types of flowers—perfect and imperfect (pistillate). In the illustration it will be noticed that the perfect flower has both pistils and stamens, while the imperfect one has only pistils. Varieties having perfect flowers will produce a crop when planted by themselves. Imperfect flowers will not bear unless pollinated with perfect varieties. Most of our commercial varieties have perfect flowers.



(After N.S.W. Department of Agriculture, Farmers Bulletin, No. 166.)
No. 1 is correctly planted, No. 2 is too high, and No. 3 is too low.



(After U.S. Department of Agriculture, Farmers Bulletin, No. 1028.)
A perfect or staminate strawberry blossom (at the left) having both pistils and stamens, and an imperfect or pistillate blossom (at the right) having pistils but no stamens. Imperfect varieties will not produce fruit unless grown near plants having perfect or pollen-producing blossoms.

The principal varieties grown in the Mount Lofty Ranges are the Gandy, Melba, Ettersburgh 89, Hackett's Giant, and Rhodes' Special.

Gandy.—This variety has been cultivated for some time, and is suited for the warmer parts of the hills. It likes a heavy class of soil. The berries are of a good quality, medium size, firm, good shape. It is a fair to good cropper, carries well, but of late years appears to be running out. There are profitable beds of this variety which are from 8 to 10 years old.

Melba.—Is better suited to the colder and wetter parts of the hills and does fairly well in most soils. This variety and Gandy are our main commercial varieties. The berries are large, round-pointed, long conic, color bright crimson red, fair flavor and texture. It is inclined to neck at the base. A variety introduced several years ago under the name of Up to Date is practically the same as Melba, possibly a selection.

Hackett's Giant.—A vigorous grower, the leaves are borne on long strong stems. The berries are very large, dark-red color (not a popular color for market), more of a wedge shape. Flesh is firm—a good jam variety. Does fairly well on poor soils without irrigation.

Ettersburgh 89.—This variety has come into prominence in the last few years. It is a vigorous grower, the leaves are round and crisp, having a very dark-green color, and carry a bluish tinge; the serrations are broad and rounded. The berries are fairly large globose conic; color a bright red. The flavor is fair to good, and it is of firm texture and one of the best carrying strawberries. It is a good jam berry, the only objection is that it is difficult to stem. Carries a very heavy first crop, but usually very light in the second. Will not thrive with bad drainage; likes a free loamy soil.

Rhodes' Special.—A medium to large berry, even shaped, long conic, a pale-yellowish pink in color; the seeds are small and lie close into the fruit, giving it a smooth appearance. The texture is soft, but has a nice flavor. This variety is a good doer and does well in most places, an excellent cropper, being highly staminate it makes a good variety for pollinating other sorts. Although this berry is soft it carries fairly well, but the picking must be frequent. An excellent variety for the home garden.

Other varieties that have been imported from New South Wales in the last few years are Euresko, King Edward VII., Phenomenal, Klondyke, and Fendelcino. The most promising of these was the Fendelcino, which has very large berries, irregular conic shape, color bright dark-red, with seeds large and prominent. It has a tendency to neck at the base. The texture is firm and has a good flavor. As the blossoms are incomplete it needs to be pollinated by another variety.

King Edward VII. should be worth persevering with, but is rather dark in color.

Klondyke and Phenomenal shaped poorly.

The leading commercial variety in New South Wales—Creswell's Seedling—should be worth a trial here.

GENERAL TREATMENT OF BEDS.

As previously stressed, good cultivation is essential, and a bed well cared for will last for a greater number of years. Towards the end of the winter months the beds are fork hoed or dug, and a good dressing of manure is applied. Manuring is a local problem, but nitrogenous manures are used generally in the hills. Bonedust or blood manure, or a mixture of both, at the rate of 10lbs. to 20lbs. to the rod. Usually under irrigation, and the crop promising well, a dressing of bone and blood or sulphate of ammonia is used in the growing period. Care should be taken not to place these types of manure too close to the plant.

The most popular and best form of irrigation is done by sprinklers, which cover the whole of the ground.

To keep the berries from being splashed with dirt after rain or irrigation, it is desirable to have a mulch either of straw or grass.

HARVESTING.

Most of the fruit for market is picked and sold in punnets, but for jam making buckets are used, similar to the raspberry bucket. The berries should not be allowed to get too ripe. When at their best they need going over every second or third day.

For marketing, the berry is pinched off at the stalk, leaving a little of the stalk attached, and should be handled carefully.

When picking for jam the berries are generally stemmed. Keep the fruit in a cool shady place after picking; a temporary brush shed made with boughs of trees answers the purpose. It is a good plan to use a receptacle for carrying about six punnets, an oblong box the height of a punnet with a handle fixed on will suffice—the picker could then grade the fruit when picking. The punnets are placed in crates holding 24, 32, and 40, which are generally used for forwarding to market.

COMMON PESTS.

White Grubs (*Anoplognathus sp.*).—These are the larvae of species of beetles, and are very destructive, feeding on the roots of the strawberry plants, particularly on the hard wooden portion of the roots. In soils affected with this white grub, cultivated crops should be grown before the strawberry plants are set. We all know the difficulty of controlling underground grubs; soil fumigants have been tried, but are only partially effective. A method that has been tried in New South Wales is treating the soil with a mixture of sawdust and tar distillate, but at present is not recommended.

Showing portion of plantation of strawberries under irrigation on the property of Mr. M. J. Vickers of Lenswood. Variety—Melba. Yielded a very heavy crop, fruiting from the first week in November till the end of May. Note the temporary shed made of boughs to place the strawberries in during picking.

Green Aphis.—Attacks the leaves at times, but not to any great extent; the attacks vary with the seasons. Dusting with a nicotine dust is useful.

Strawberry Leaf Spot.—This fungus disease appears in almost every strawberry bed, but does not seriously injure the plant. It causes numerous small, more or less dark-brown spots to appear on the leaf, and in time the centre of each spot becomes dead or withered. As a means of controlling leaf spot diseases some growers make a practice of mowing the leaves of the plants after harvesting and then burning them when they have dried off. Burning should not be done if the ground is dry, as there is a danger of destroying the crowns of the plants.

Mildew.—This disease is fairly prevalent in the hills in some seasons, but is controlled by dusting with flowers of sulphur or spraying with a solution of lime sulphur at a strength of 1 in 50.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1933-34.

SECTION 1.—WHITE LEGHORNS.

Competitor.	Address.	Score to Month ending May 31st, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
E. F. Ashmeade	398, Magill Road, Kensington Park	(1) 10	(2) 12	(3) 22	44
L. R. Badcock	77, Findon Rd., Woodville	(4) 8	(5) 25	(6) 17	50
C. J. C. Burton	Mallala	(7) 18	(8) 18	(9) 29	65
C. J. C. Burton	Mallala	(10) 18	(11) 9	(12) 19	46
W. A. Carter	2, Grosvenor St., Glandore	(13) 15	(14) 25	(15) 1	41
W. A. Carter	2, Grosvenor St., Glandore	(16) 24	(17) 25	(18) 4	53
B. Cooke	Kanmantoo	(19) 30	(20) 24	(21) 18	72
H. F. Cox	Samson Road, Glanville Blocks	(22) 10	(23) 17	(24) 15	42
H. F. Cox	Samson Road, Glanville Blocks	(25) 12	(26) 21	(27) 22	55
L. H. Crawford	Military Road, Grange	(28) 13	(29) 25	(30) 20	58
L. H. Crawford	Military Road, Grange	(31) 22	(32) 3	(33) 21	46
R. C. Crittenden	William Street, Kilkenny North	(34) 28	(35) 26	(36) 21	75
Chas. H. Day	Box 28, Salisbury	(37) 14	(38) 6	(39) 18	38
J. H. Dowling	Glossop	(40) 25	(41) 15	(42) 12	52
T. Duhring	Mallala	(43) 21	(44) 21	(45) 1	43
T. Duhring	Mallala	(46) —	(47) 2	(48) —	2
H. Fidge	313, Cross Roads, Clarence Park	(49) 12	(50) 9	(51) 5	26
V. F. Gameau	Findon Road, Woodville	(52) 1	(53) 13	(54) 18	32
W. Chas. Slape	Magill Road, Magill	(55) 3	(56) 29	(57) 16	48
G. C. Gavin	Salisbury	(58) 11	(59) 6	(60) 7	24
G. C. Gavin	Salisbury	(61) 18	(62) 28	(63) 18	64
H. H. Hefford	McHenry Street, Murray Bridge	(64) 19	(65) 15	(66) 8	42
H. H. Hefford	McHenry Street, Murray Bridge	(67) 37	(68) 19	(69) 8	64
W. H. A. Hodgson	Commercial Rd., Salisbury	(70) 15	(71) 11	(72) 9	35
W. H. A. Hodgson	Commercal Rd., Salisbury	(73) 11	(74) 14	(75) 6	31
E. A. Lamerton	Cross Roads, Edwardstown	(76) 3	(77) 21	(78) 29	53
C. H. Lines, jun.	Box 75, Gladstone	(79) 18	(80) 35	(81) 4	57
C. H. Lines, jun.	Box 75, Gladstone	(82) 21	(83) 11	(84) 16	48
V. F. Gameau	Findon Road, Woodville	(85) 2	(86) 4	(87) 15	21
L. A. G. Pitt	24, John Street, Payneham	(88) 18	(89) 1	(90) 13	32
L. A. G. Pitt	24, John Street, Payneham	(91) 21	(92) 15	(93) 15	51
H. A. Rasmussen	Swan Terrace, Ethelton	(94) 15	(95) 20	(96) 31	66
H. A. Rasmussen	Swan Terrace, Ethelton	(97) 17	(98) 21	(99) 21	59
S. E. Reedman	51, Gilbert Street, Gilberton	(100) 30	(101) 31	(102) 22	83
Bruce Rowe	"St. Kevern," Two Wells	(103) 18	(104) 8	(105) 30	56
Bruce Rowe	"St. Kevern," Two Wells	(106) 14	(107) 7	(108) 5	26
H. J. Stacey	Uraidla	(109) 9	(110) 8	(111) 8	25
H. J. Stacey	Uraidla	(112) 17	(113) 16	(114) 2	35
Thomas & Elson	53, Clifton Street, Hawthorn	(115) 18	(116) 11	(117) 18	47
Thomas & Elson	53, Clifton Street, Hawthorn	(118) 7	(119) 5	(120) 10	22
H. L. Twartz	Gawler	(121) 24	(122) 19	(123) 26	69
H. L. Twartz	Gawler	(124) 14	(125) 11	(126) 23	48
F. F. Welford	1, Ludgate Circus, Colonel Light Gardens	(127) 18	(128) 36	(129) 16	70
F. F. Welford	1, Ludgate Circus, Colonel Light Gardens	(130) 27	(131) 10	(132) 7	44

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitor.	Address.	Score to Month ending May 31st, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
A. P. Urlwin	Box 80, Balaklava	(133) 2	(134) 25	(135) 20	47
A. W. Dawes	230, Portrush Road, Glenunga Gardens	(136) 30	(137) 9	(138) 20	59
Total—Section 1		—	—	—	2,166
SECTION 2—ANY OTHER LIGHT BREEDS.					
V. F. Gameau	Findon Road, Woodville (Minorcas)	(139) 13	(140) 7	(141) —	20
M. O. and C. A. Roberts	Torrens Road, Kilkenny (Minorcas)	(142) 2	(143) 16	(144) —	18
Total—Section 2		—	—	—	38
SECTION 3—BLACK ORPINGTONS.					
Arthur Cook	187, Goodwood Road, Colonel Light Gardens	(145) 35	(146) 36	(147) 15	86
B. Cooke	Kanmantoo	(148) 31	(149) 9	(150) 30	70
L. H. Crawford	Military Road, Grange	(151) 5	(152) 2	(153) 9	16
L. H. Crawford	Military Road, Grange	(154) 13	(155) 13	(156) 34	60
Les. Darcy	Mypolonga	(157) 22	(158) 13	(159) 22	57
Les. Darcy	Mypolonga	(160) 13	(161) 22	(162) 14	49
J. H. Dowling	Glossop	(163) 5	(164) 2	(165) —	7
H. Fidge	313, Cross Rds., Clarence Pk.	(166) 15	(167) 20	(168) —	35
H. H. Hefford	McHenry Street, Murray Bridge	(169) 17	(170) 7	(171) 20	44
F. J. Hudson	54, Willcox Av., Prospect	(172) 29	(173) 42	(174) 16	87
A. G. Dawes	230, Portrush Road, Glenunga Gardens	(175) 18	(176) 40	(177) 8	66
C. H. Lines, jun.	Box 75, Gladstone	(178) 10	(179) 4	(180) 1	15
C. H. Lines, jun.	Box 75, Gladstone	(181) 17	(182) 2	(183) 19	38
H. J. Mills	Edward St., Edwardstown	(184) 17	(185) 31	(186) 31	79
H. J. Mills	Edward St., Edwardstown	(187) 29	(188) 16	(189) 14	59
J. Rawe	Honeyton St., Seaton Pk.	(190) 28	(191) 7	(192) —	35
S. E. Reedman	51, Gilbert St., Gilberton.	(193) 28	(194) 19	(195) 39	86
S. E. Reedman	51, Gilbert St., Gilberton.	(196) 2	(197) 20	(198) 29	51
H. L. Twartz	Gawler	(199) 25	(200) 36	(201) 18	79
A. G. Dawes	230, Portrush Road, Glenunga Gardens	(202) 26	(203) 39	(204) 32	97
N. F. Richardson	60, Beaufort St., Woodville Park, Kilkenny	(205) 34	(206) 17	(207) 23	74
W. H. L. Wittenberg	3, Rushton St., Goodwood	(208) 38	(209) 13	(210) 10	61
W. H. L. Wittenberg	3, Rushton St., Goodwood	(211) 8	(212) 39	(213) 31	78
W. Woodley	Tailem Bend	(214) —	(215) —	(216) —	—
W. Woodley	Tailem Bend	(217) —	(218) —	(219) —	—
Total—Section 3		—	—	—	1,329
SECTION 4—ANY OTHER HEAVY BREED.					
H. Fidge	313, Cross Roads, Clarence Park (Rhode Is. Reds)	(220) —	(221) —	(222) —	—
V. F. Gameau	Findon Road, Woodville (Rhode Island Reds)	(223) 14	(224) —	(225) 10	24
V. F. Gameau	Findon Road, Woodville (Rhode Island Reds)	(226) —	(227) 7	(228) 19	26
H. J. Mills	Edward St., Edwardstown (Rhode Island Reds)	(229) 37	(230) 22	(231) 20	79
W. R. Williams	28, Avenue Rd., Frewville (Rhode Island Reds)	(232) 26	(233) 25	(234) 16	67
W. R. Williams	28, Avenue Rd., Frewville (Rhode Island Reds)	(235) 24	(236) 17	(237) 32	73
Bruce Rowe	"St. Kevern," Two Wells (Barnevelders)	(238) 2	(239) —	(240) —	2
Bruce Rowe	"St. Kevern," Two Wells (Welsumers)	(241) —	(242) —	(243) —	—
Total—Section 4		—	—	—	271

RED COMB EGG ASSOCIATION.

OFFICIAL EGG-LAYING COMPETITION, 1933-34.

Conducted at the Parafield Poultry Station under the supervision of the Department of Agriculture.

LEADING SCORES TO WEEK ENDED JUNE 2nd.—FIRST GRADE EGGS ONLY.

WHITE LEGHORNS.

Singles—	Eggs Laid.	Bird Nos.
H. H. Hefford	37	67
F. F. Welford	36	128
C. H. Lines, jun.	35	80
Trios—		
S. E. Reedman	83	100—102
R. C. Crittenden	75	34—36
B. Cooke	72	19—21
Teams—		
H. A. Rassmussen	125	94—99
H. L. Twartz	117	121—126
F. F. Welford	114	127—132

MINORCAS.

Singles—		
M. O. and C. A. Roberts	16	143
V. F. Gameau	13	139

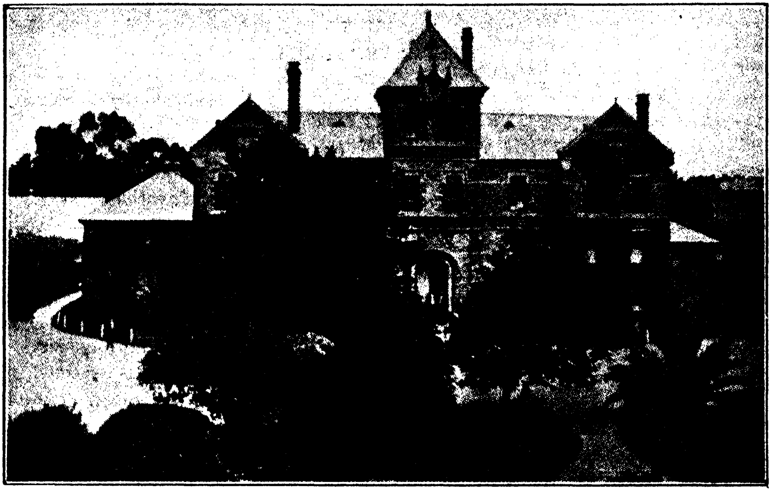
BLACK ORPINGTONS.

Singles—		
F. J. Hudson	42	173
A. G. Dawes	40	176
W. H. L. Wittenburg	39	212
A. G. Dawes	39	203
S. E. Reedman	39	195
Trios—		
A. G. Dawes	97	202—204
F. J. Hudson	87	172—174
S. E. Reedman	86	193—195
Teams—		
W. H. L. Wittenburg	139	208—213
H. J. Mills	138	184—189

ANY OTHER HEAVY BREEDS.

Rhode Island Reds.

Singles—		
H. J. Mills	37	229
Trios—		
H. J. Mills	79	229—231
W. R. Williams	73	235—237
Teams—		
W. R. Williams	140	232—237
V. F. Gameau	50	223—228



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PAPERS READ AT CONFERENCES.

STOCK TROUBLES.

[By P. WISE, Mount Barker.]

Dairying Districts Conference, Mount Barker, May 11th, 1933.

Stock troubles are very often brought about because owners do not take sufficient preventive measures.. Even with the best of attention, some disturbance in stock will crop up. A herd of cows of big production requires most attention, especially if on good feed and following calving.

Preventive Measures.—A system cleanser is needed to prevent contamination of the blood, blockage of the tubes connected with the womb, thereby preventing pregnancy in the next season and probable attack by mammitis or inflammation of the udder, due to invasion of bacteria, *via* the blood vessels leading into the milk quarters. This is one way mammitis can attack and probably does more often than is expected.

After calving, give 1lb. Epsom salts, 1 teaspoonful of saltpetre, with a dessertspoonful of ground ginger and a cup of treacle in a pint of warm water. Then follow with a bottle of clean water. Follow up the drench in a few hours or the next day with 2 tablespoonfuls of carbonate of soda, and if slow in casting the after-birth, add 1 teaspoonful of saltpetre together with a dessertspoonful of ground ginger in 1 pint of water. Place this substance dry into the bottle and add the water just previous to administering the drench.

Retention of the Placenta.—Where the after-birth is retained, the previous mentioned drench will do much to help the position. Again, early removal is best if the cleanings are still clinging. Do not let this get into a state of putrefaction.

First cleanse the retained portion protruding, especially near the vagina. Wash off the same with a good antiseptic wash. Thoroughly wash the hands. Place the left hand right up to the vagina, the same resting with the back of the hand down, holding the portion to come away; the right hand pulling gradually until reaching the finer threads attached, when these will break.

Bring about 8 pints of water to boiling point and allow it to cool off. Strain water through a white cloth that has been also boiled, add enough Condy's crystals to colour the water a violet shade, and inject same with a clean pump.

Cows Coming Back for Repeat of Service.—If this system of cleaning of the animal is practised, the above will not be likely. Action which may prove beneficial is as follows:—Previous and up to within the day when the cow is becoming troublesome, give the animal a douche out with a solution of carbonate of soda. Have the water well boiled, cooled off, and strained, say 2 or 4 pints, add 2 tablespoonfuls of carbonate of soda to each pint, and syringe with this solution. Place the point of the syringe tube into the neck of the uterus. Condy's crystal solution, just enough to stain one's fingers, may be a good douche, but it should not be administered too near the time of service.

Drenching.—A drench must be given with great care and notice taken that the animal is swallowing, otherwise the liquid gets down the trachea or windpipe, and finding its way into the lung tissue, causes pneumonia. Drenching a cow with two attendants should be an easy job. One stands on the near side and takes the near-side horn with the left hand, and the off-side with the right, standing against the near-side shoulder. The drencher passes his left hand under the offside horn and over the top of the nose, placing the fingers in the mouth, of course clear of the grinders, and places the drenching bottle in the mouth. If the animal is restless, hold her nostril with the thumb and fingers. The drencher's position standing against the offside shoulder and arm under the horn is safe. If the animal tries to bend down, grip the nose, keep well in, and turn the neck of the bottle against the roof of her mouth.

Due to research in different countries regarding deficiency of minerals, it is likely that many difficulties will be overcome or not met with so often through giving saltlicks containing minerals which the soils lack. Breeders in other parts record the disappearance of abortion when a few drops of 7 per cent. tincture of iodine are added twice weekly to the food of cows. It is also thought probable that in many cases abortion is a question not so much of lack of lime and phosphorus, as lack of iodine that promotes their assimilation.

MILK FEVER.

An outbreak of this trouble reflects no disgrace on a breeder, but indicates that his milkers have reached the breaking point of their production. The cow is most likely to show this on her fourth calving; heifers do not contract milk fever. Milk fever can be prevented by following this simple method, or if the cows go down, it will be with a slight attack. Within a day or so of calving give a drench of 1lb. of Epsom salts, 1 teaspoonful of saltpetre, and 1 dessertspoonful of ground ginger in 1 pint of water with a cup of treacle. Provided the calf is due, this mixture will help calving.

If there is loss of milk secretion, trembling, and a staggering walk are in evidence, give the drench if the animal can take it. At once sterilise the pump outfit, especially the nipple entering the teat. Do not touch the point of the teat with the hand, or the nipple entering the teat. Wash the udder previous to using the pump, and pump up each teat, say 60, 70, or 100 full bike pumps, into each quarter. Do not tie the teat; hold it a few seconds, it will not generally waste much air.

When the bicycle pump is used, remove the valve from the tyre and remove the valve rubber from the valve. Sterilize the nipple in boiling water; also draw a solution through the pump and pump off until dry. Use the full connection, otherwise the nipple growing hot due to the pumping will burn the point of the teat canal. *Position of the Cow.*—With the udder well inflated, and the teat not tied, place the animal on her brisket, propping that part first with well filled cornsacks each side, the front legs being tucked in under the cow. Second, go to the hindquarters, have a well-filled sack ready, and bring the animal on her haunches. Keep the cow in this position. After a time, look for the passing of urine, aid the same by a massaging action of the hand up and down between the top of the udder to underneath the vagina lip. In stubborn cases, rake the rectum as well; in fever, power of evacuation is negligible, but the back bowel will fill up again following a clean-out. If after one hour the cow is not up, the rectum passage is empty, water has been passed, and paralysis not present, administer with great care 2 tablespoonfuls of carbonate of soda in 1 pint of water with 1 dessertspoonful of ground ginger and place 1 teaspoonful of nux vomica on the tongue with treacle.

MAMMITIS (INFLAMMATION OF THE UDDER).

This may be caused by a knock, blockage of the milk duct, bruising, pinching through a long lay down on a big udder, organisms which have entered by the teat canal, through wounds, or through the blood or by way of the uterus. *Symptoms.*—Hardness of the udder tissue, teat trouble, blood, pus or any abnormal color in the milk. At times discolored blood will show in the milk, due to a rupture of blood vessels. *Treatment.*—Apply hot foments (not in blood rupture) at once for 15 minutes, dry quickly, and follow with camphorated oil before the cold can strike the udder. Milk away all possible secretions from the affected quarter. Do this twice before noon and after noon without fail. A drench—1lb. Epsom salts, 1 teaspoonful saltpetre, dessertspoonful of ginger, and 1 cup of treacle in 1 pint of water—will help to bring about the best result.

AILMENTS OF CALVES.

These are generally constipation, indigestion, and diarrhoea. Diarrhoea may be the first symptom of the two first-named—constipation and indigestion. At once give two or more tablespoonfuls, according to size and age of the calf, or castor oil, with a teaspoonful or two of milk. The oil will carry off the organisms often causing diarrhoea, leaving a binding effect afterwards. White scour is harder to deal with. Remove the calf to fresh quarters, and sprinkle lime about the premises. Prepare 2ozs. of lime to 1gall. of water, allow this to settle, and add a little of the solution to the milk. Any change in the feeding of a calf is likely to cause trouble. In this case dilute, and add a pinch of carbonate of soda. Farmers should have a thermometer, for with its use one can often determine the health of an animal.

Bloat may be caused in calves by feeding frothy separator milk. A cup of new milk added to 2galls. of skim will avoid this. When bloat occurs, quick action is necessary. Clear the rectum or back bowel with warm soapy water. Give 2 teaspoonfuls of carbonate of soda with 1 of ginger in a half-pint of warm water, and massage the left flank with the palm of the hand, working upwards and towards the tail.

HORSES.

The horse is very subject to digestive trouble. For colic, give 1 pint of raw linseed oil, 2, 3, or 4 tablespoonfuls of turpentine—according to the size of the horse—and clear the back bowel by raking. Keep the horse on the move, let him have a roll, massage the stomach, and again move the animal. At times, hot coffee to follow will give the desired result.

SHEEP.

This animal is generally a poor patient, and more often not treated at all. If a drench is to be given it should be administered at the side of the mouth by way of a spoon or very small bottle. Digestive trouble is indicated by the sheep standing with its head down and not eating. This will often be relieved immediately by 1 teaspoonful of turpentine in 4 of olive oil. For worms in sheep, 1 teaspoonful of raw linseed oil and 1 teaspoonful of turpentine in a little milk has proved very helpful. The Stock Department has issued a good booklet on the treatment of worms in sheep. Sheep, most often lambs, go off very quickly during the time of luxuriant pasture, especially on rich clovers. They should be moved at once on to more scanty feeding on hillsides or bush country.

Sometimes on slaughter a green abscess will be noticed in the flank glands; again, in the shoulder glands (pre-scapular), and also the lung glands (posterior mediastinal) carry the lesion. This is caused by a bacillus which enters the wounds caused at the time of shearing. All wounds should be dressed with an antiseptic solution. Do not dip off the shears—allow the wounds to heal first. It is probable that iodine in salt-licks will play an important part against the above disease and help worm-infested sheep.

PIGS.

The ailments of pigs for the most part are digestive. They are hard to treat, especially with drenches, because in squealing and fighting the liquid often finds its way into the lungs, causing pneumonia. Drench only 1 teaspoonful at a time. The following experience may prove of interest. I saw six very nice young pigs eight weeks old, sold at a sale. I knew the seller and his method of feeding. A day or two following the purchase one pig was dead, one nearly so, and the other four could only with difficulty stand up. I *post-mortemed* the dead pig, and concluded death was due to diet trouble. The pig which was very ill was given 1oz. of Epsom salts, a quarter-teaspoonful of nitre, and 1 teaspoonful of ground ginger. This was made into a paste, cut up, rolled up to the size of a marble, and pushed down the throat with the aid of a clothespeg, the mouth being held open with binder twine. The rectum was evacuated by 2 cups of warm soapy water. The four pigs received a watery mixture of pollard, in which was dissolved Epsom salts and saltpetre. Within a day the pigs were out of danger.

In cases where valuable animals are to be treated the farmer should seek the services of a veterinary surgeon.

ADVISORY BOARD OF AGRICULTURE.

The monthly meeting of the Advisory Board of Agriculture was held on Wednesday, May 31st, there being present Messrs. H. N. Wicks (Chairman), A. M. Dawkins, S. Shepherd, F. Coleman, P. J. Baily, A. L. McEwin, A. J. Cooke, Dr. A. E. V. Richardson (Director Waite Agricultural Research Institute), and H. C. Pritchard (Secretary.)

Apologies were received from Messrs. J. W. Sandford, R. H. Martin, and Prof. A. J. Perkins.

Pure Seed.—At the February meeting it was decided to obtain information from the New South Wales Department relative to the system adopted in that State by which crops of wheat suitable for seed were listed for public information. A grower's name was added to the list (1) after the crop had been inspected during the growing period by a field officer and favorably reported upon, and (2) after a sample of the seed had been received by the Under Secretary, Department of Agriculture, Sydney, and had satisfactorily passed a germination test or satisfactorily passed inspection. The list of crops recommended for seed was then published in the *Agricultural Gazette.*

This matter was referred to the Director of Agriculture, who endorsed the following report by the Supervisor of Experimental Work (Mr. R. C. Scott):—

"In order to give a certificate of purity an inspector must examine the crop shortly before maturity. This means that there is only a limited period during the growth of the crop when an examination for trueness-to-type and freedom from strangers can be thoroughly carried out. Any scheme of a general nature must be thrown open to

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all farmers, and since the average farmer is not a good judge of a crop likely to prove suitable for seed, a large number of applications would probably be received. This would necessitate sufficient staff to cope with the work in the limited time available.

"I am of the opinion that such a scheme of certification would be more than could be efficiently handled by the staff available for the purpose, since at this time of the year the District Instructors are fully occupied with the crop competitions. For this reason I would not recommend the adoption of an open scheme for certification, but some additions to the existing arrangements would be of advantage. In this connection, it is suggested that farmers entering a crop for competition be eligible to make application for the judge to examine other crops on the farm with the view of their inclusion in the list of varieties recommended for seed. In order that the judge should be able to map out his proceedings, it would be necessary for such applications to reach the department prior to the commencement of judging.

"It is also recommended that the inspection of the seed as adopted in New South Wales be included in our plan and that the owner of each crop passed for purity be required to submit a sample of the grain for examination before the variety could be added to the list of recommended crops."

The Board decided to secure information from the Victorian Department of Agriculture regarding the system adopted in that State for the certification of seed wheat and that the matter be referred to the Crop Competition Committee.

DEHORNING OF BULLS.—*Dairy Conference Resolution*—"In the interests of human life, all bulls in dairy herds should be dehorned, and that it be a request to the Advisory Board of Agriculture that the Board bring this resolution to the notice of the Royal Agricultural Society, together with a suggestion that judges at the Society's show should not allow any points for a bull's horns when judging dairy bulls.."

The Board decided to forward the resolution to the Royal Agricultural Society for their consideration.

DAIRY INDUSTRY ACT.—*Dairy Conference Resolution*—"That this Conference asks that the Dairy Industry Act of 1928 be amended to compel all factories to pay for all cream according to grade on a deferential basis."

It was decided to bring this resolution under the notice of the Minister.

DUTY ON SULPHATE OF AMMONIA.—A communication was received from the Commonwealth Tariff Board stating that a public inquiry into the question of necessity for the rates of duty provided under tariff resolutions now operating in respect of sulphate of ammonia and fertilisers which may be regarded as substitutes for sulphate of ammonia would be conducted by the Tariff Board at Parliament House, North Terrace, at 11 a.m. on Tuesday, July 4th. Mr. H. N. Wicks was appointed to give evidence before the Tariff Board on this occasion.

LIFE MEMBERS.—The name of Mr. H. R. Jacobs, of the Miltalie Branch, was added to the roll of life members of the Agricultural Bureau.

NEW BRANCHES.—Approval was given for the formation of a Women's Branch at Morchard, with the following as foundation members:—Mesdames A. R. Lang, A. J. Twigden, F. Mills, S. Twigden, W. Twigden, C. Koch, B. S. McCallum, H. Tilbrook, F. H. Stainer, C. Schulz, Misses G. McCallum and Kulpe.

Conditional approval was also given for the formation of Women's Branches at Laura Bay, Wepowie, and Taplan.

NEW MEMBERS.—The following names were added to the rolls of existing Branches:—Yadnarie—J. R. Mackie; Moorlands—A. T. Mann; Kelly—Harold Cliff; Balumbah—Edward Murphy, Allan Van Heythuysen; Truro—F. J. G. Collins; Kapinnie—T. N. Wright; McLaren Flat Women's—Miss Iris Nicholle; Redhill—W. Hancox; Taragoro—Geo. Wilde; Laura Bay—Wm. Bourke, M. Morrison; Jervois—J. L. Kesting; Chilpuddie Rocks—Gillen McMahon.

Other items were taken in committee.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on June 1st, 1933:—

BUTTER.—Since last report there have been splendid general rains in all the dairying areas, and conditions throughout the State are very promising except over the far northern parts outside of Goyder's line, where the weather conditions have continued dry. Production of butter has moved forward satisfactorily, and will steadily improve during the coming weeks. Arrangements are well in hand for the exporting of surplus, and already quantities have been packed for that purpose, but for the time being Western Australia is drawing on this market for fresh supplies of choicest, and the floors are therefore being kept clear in this way. Local demand is keeping up well, and the turnover is now better than for some time past. Unfortunately London values show no indication of great improvement as yet. Choicest creamery fresh butter in bulk, 1s. 0¾d.; prints and delivery extra. (These prices are subject to the stabilisation levies.) Store and collectors', 8½d. to 9d. per lb. at store door, less usual selling charges; special lots higher.

EGGS.—As usual at this time of the year, production is at a low level, and the wintry conditions of the past week or two have shortened production acutely, and for the next few weeks supplies are likely to be only sufficient for local needs. Rates continue steady. Ordinary country eggs, hen or duck, 1s. per dozen; selected, tested, and infertile, to 1s. 5d.

CHEESE.—Only limited supplies are now coming forward from the factories, as production in the South-East is now at lowest, but should improve within the next few weeks. Values have firmed in consequence of the shortening of supplies and stronger Australian demand. New makes, medium and large, 8d. to 8¾d.; loaf, 8½d. to 9d.; semi-matured and matured, 10d. to 11d. per lb.

BACON.—Under the influence of rising values for live hogs and demand for bacon showing the usual winter improvement, values hardened. Best local sides, 7¾d. to 8d.; best factory-cured middles, 8½d. to 9d.; large, 8d.; rolls, 6½d. to 7d.; hams, 10d. to 10½d. per lb.; cooked, 1s. to 1s. 0½d. Lard, prints 5s. per dozen.

ALMONDS.—Considerable quantities of all classes were marketed during the month, but local buyers operated freely, and all lots were cleared. Kernels also sold freely and are now somewhat short of requirements. Brandis and softshells, 7½d. to 8½d.; hardshells, 4½d. to 4¾d. per lb. Kernels, 1s. 9½d. to 1s. 10½d. per lb.

HONEY.—Although the consignments received were not large last month, heavy stocks are still held by some apiarists, and are drawn on as wanted. Values were without change. Prime clear-extracted in liquid condition, 3d. to 3¼d. per lb.; lower grades, 1½d. to 2d. per lb.

BEESWAX.—Much heavier quantities were marketed during the month, but local and interstate sales cleared all offering; 1s. 0½d. to 1s. 1d. per lb,, according to quality.

LIVE POULTRY.—As usual during the winter months, the supplies of live poultry have shown a shrinkage and the markets have ruled firm in consequence. Prime quality stock has continued short of requirements, although considerable numbers of the lighter breeds were marketed at our three sales each week. We advise consigning. Crates loaned on application. Prime roosters, 3s. 3d. to 4s. 6d.; nice-conditioned cockerels, 2s. 6d. to 3s.; fair-conditioned cockerels, 2s. to 2s. 5d.; chickens lower. Heavyweight hens, 2s. 4d to 3s. 4d.; medium hens, 1s. 9d. to 2s. 3d.; light hens, 1s. 5d to 1s. 8d.; couple of pens of weedy sorts lower. Geese, 2s. 6d. to 3s. 6d.; goslings lower. Prime young Muscovy drakes, 3s. to 4s. 2d.; young Muscovy ducks, 1s. 10d. to 2s. 4d.; ordinary ducks, 1s. 6d. to 2s. 3d.; ducklings lower. Turkeys, good to prime condition, 8d. to 11½d. per lb. live weight; do., fair condition, 6d. to 7½d. per lb. live weight; fattening sorts lower. Pigeons, 4d to 4½d. each.

POTATOES.—Local new, 6s. 6d. per cwt.

ONIONS.—New season's, 6s. 6d. per cwt.

IMPORTS AND EXPORTS OF FRUITS, PLANTS, ETC., DURING THE MONTHS OF MARCH AND APRIL, 1933.

IMPORTS.

Interstate.

	March.	April.
Apples (bushels)	479	727
Bananas (bushels)	6,727½	8,445
Citrus—		
Lemons (bushels)	3	—
Oranges (bushels)	15	5
Grapes (bushels)	3½	5
Mixed fruit (bushels)	2	—
Passion fruit (bushels)	40	330
Peaches (bushels)	7	—
Pears (bushels)	6	6
Persimmons (bushels)	—	11
Pineapples (bushels)	617	850
Tomatoes (bushels)	222	77
Blackberries (package)	1	—
Cape gooseberries (bushel)	1	—
Nuts—		
Mixed (bag)	1	1
Peanuts (bags)	29	89
Peanuts, kernels (bags)	36	8
Beans (bushels)	5	—
Carrots (bags)	10	—
Cauliflowers (bags)	—	25

	March.	April.
Egg fruit (bushels)	4	1
Melons (bags)	4	—
Onions (bags)	—	326
Peas (bags)	3	—
Bulbs (packages)	21	16
Plants (packages)	74	34
Seeds (packages)	25	22
Trees, fruit (packages)	—	10
Wine casks (No.)	2,249	1,741
Fumigated—		
Trees, fruit (packages)	—	10
Wine casks (No.)	29	13
Rejected—		
Apples (bushels)	10	—
Bananas (bushels)	15	15
Grapes (bushels)	3½	5
Peaches (bushels)	2	—
Persimmons (bushels)	—	11
Pineapples (bushels)	8	12
Second-hand cases (No.)	—	2

OVERSEAS.

(State Law.)

	March.	April.
Wine casks (No.)	529	1,017
Fumigated—Wine casks (No.)	60	60

Federal Quarantine Act.

	March.	April.	March.	April.
	Packages.	Lbs.	Packages.	Lbs.
Seeds, &c.	2,587	440,383	4,759	839,114
Canes	212	—	154	—
Chests, cocoanut	165	—	470	—
Chests, tea	1,233	—	2,096	—
		Sup. ft.		Sup. ft.
Timber	133,415	1,656,135	123,154	1,488,775

EXPORTS.

Federal Commerce Act.

		March. Pkgs.	April. Pkgs.
India	Apples	2,847	2,347
	Grapes	796	675
	Pears	125	—
Egypt	Apples	375	—
England	Apples	58,548	75,284
	Pears	4,019	6,683
France	Apples	—	6
Germany	Apples	4,424	29,522
Holland	Apples	303	—
New Zealand	Seed, Clover	204	—
Netherlands, East Indies	Apples	2,790	1,050
	Grapes	105	326
	Peaches	—	6
	Pears	407	461
	Quinces	—	3
	Nuts	2	—
	Vegetables	8	16

		March. Pkgs.	April. Pkgs.
Scotland	Apples	6,100	4,658
Singapore	Apples	1,329	944
	Citrus—		
	Lemons	—	2
	Grapes	75	161
	Peaches	26	5
	Pears	234	262
	Quinces	—	44
	Vegetables	68	98
Straits Settlements	Apples	10	10
	Grapes	5	7
	Peaches	2	—
	Pears	3	4
	Potatoes	20	20
	Other vegetables	6	19
Sweden	Apples	425	5,073

Scotland 6100 Singapore 1329 . .

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of May, 1933, also the average precipitation for the month of May, and the average annual rainfall.

Station.	For May, 1933.	Av'ge for May.	Av'ge Annual Rainfall.
FAR NORTH AND UPPER NORTH.			
Oodnadatta	0·51	0·30	4·70
Marree	0·48	0·60	5·89
Farina	0·73	0·66	6·47
Copley	0·31	0·99	7·94
Beltana	0·96	0·95	8·54
Blinman	0·99	1·36	11·95
Hookina	1·02	1·46	11·53
Hawker	0·96	1·39	12·30
Wilson	1·06	1·25	11·78
Gordon	0·69	1·03	10·63
Quorn	1·11	1·48	13·29
Port Augusta	1·26	1·11	9·42
Bruce	1·08	0·97	9·93
Hammond	0·91	1·07	11·31
Wilmington	1·74	2·01	17·43
Willowie	1·44	1·30	12·19
Melrose	3·12	2·59	22·85
Booleroo Centre	1·96	1·61	15·15
Port Germein	1·65	1·55	12·43
Wirrabara	2·41	2·13	19·21
Appila	1·85	1·48	14·57
Cradock	0·98	1·13	10·83
Carrieton	0·91	1·28	12·31
Johnburg	0·64	1·14	10·61
Eurelia	0·88	1·34	12·87
Orroroo	1·27	1·33	13·21
Nackara	1·06	—	11·16
Black Rock	1·52	1·30	12·41
Oodlawirra	1·30	1·26	11·56
Peterborough	1·51	1·34	13·21
Yongala	2·04	1·44	14·42
NORTH-EAST.			
Yunta	1·16	0·98	8·50
Waukaringa	0·85	0·87	8·00
Mannahill	0·38	0·82	8·28
Cockburn	0·45	0·99	7·96
Broken Hill	0·28	0·99	9·63
LOWER NORTH.			
Port Pirie	1·35	1·60	13·17
Port Broughton	3·02	1·67	13·93
Bute	3·13	1·87	15·36
Laura	2·09	1·89	17·91
Caltowie	1·71	1·81	16·69
Jamestown	2·10	1·85	17·71
Gladstone	2·34	1·72	16·29
Crystal Brook	2·37	1·81	15·78
Georgetown	3·56	2·11	18·35
Narridy	2·39	1·84	15·85
Redhill	3·21	1·94	16·55
Spalding	3·27	2·17	18·99
Gulnare	3·20	2·21	18·56
Yacka	3·39	1·75	15·33
Koolunga	3·04	1·70	15·40
Snowtown	3·87	1·84	15·64
LOWER NORTH.—*continued.*			
Brinkworth	3·25	1·87	15·74
Blyth	3·36	2·07	16·77
Clare	4·38	2·93	24·53
Mintaro	4·84	2·75	23·42
Watervale	4·92	3·12	26·91
Auburn	4·78	2·78	23·98
Hoyleton	3·10	2·00	17·32
Balaklava	2·23	1·86	15·49
Pt. Wakefield	2·36	1·58	12·93
Terowie	1·61	1·24	13·35
Yarcowie	2·22	1·33	13·57
Hallett	3·08	1·68	16·40
Mount Bryan	3·98	1·79	16·65
Kooringa	3·08	1·99	17·89
Farrell's Flat	3·52	2·12	18·65
WEST OF MURRAY RANGE.			
Manoora	3·55	2·20	18·83
Saddleworth	3·63	2·24	19·55
Marrabel	4·10	2·20	19·84
Riverton	4·24	2·37	20·75
Tarlee	2·74	2·08	18·11
Stockport	2·59	1·81	16·88
Hamley Bridge	2·40	1·77	16·54
Kapunda	3·04	2·26	19·79
Freeling	2·80	1·91	17·85
Greenock	3·48	2·39	21·56
Truro	3·37	2·16	19·96
Stockwell	3·44	2·18	20·12
Nuriootpa	3·67	2·23	20·64
Angaston	3·95	2·50	22·43
Tanunda	3·89	2·47	22·02
Lyndoch	3·74	2·52	23·45
Williamstown	6·41	3·12	27·71
ADELAIDE PLAINS			
Owen	2·57	1·71	14·33
Mallala	2·82	1·94	16·56
Roseworthy	3·38	1·87	17·34
Gawler	2·37	2·31	18·96
Two Wells	2·68	1·87	15·70
Virginia	3·55	2·07	17·12
Smithfield	3·18	2·20	17·50
Salisbury	3·84	2·23	18·54
Adelaide	5·40	2·73	21·10
Glen Osmond	7·85	3·19	25·96
Magill	5·92	3·25	25·50
MOUNT LOFTY RANGES.			
Teatree Gully	6·37	3·43	27·30
Stirling West	13·39	5·47	46·91
Uraidla	12·64	5·36	43·91
Clarendon	7·69	3·91	32·82
Morphett Vale	4·28	2·68	22·64
Noarlunga	4·67	2·46	20·34
Willunga	6·05	3·44	26·01
Aldinga	4·23	2·47	20·21

RAINFALL—*continued.*

Station.	For May, 1933.	Av'ge for May.	Av'ge Annual Rain-fall.
MOUNT LOFTY RANGES—*contd.*			
Myponga	6·64	3·79	29·48
Normanville	4·10	2·68	20·69
Yankalilla	4·32	2·92	22·85
Mount Pleasant	6·46	3·00	27·18
Birdwood	7·56	3·18	29·15
Gumeracha	8·21	3·98	33·39
Millbrook Res.	9·22	4·63	34·86
Tweedvale	9·56	4·03	35·89
Woodside	8·40	3·61	32·25
Ambleside	10·31	3·88	34·87
Nairne	7·07	3·11	28·09
Mount Barker	7·69	3·76	31·79
Echunga	8·07	4·06	33·15
Macclesfield	6·01	3·34	30·43
Meadows	7·34	4·17	36·12
Strathalbyn	3·14	2·27	19·34
MURRAY FLATS AND VALLEY.			
Meningie	3·23	2·24	18·37
Milang	1·77	1·70	14·92
Langhorne's Ck.	2·03	1·60	14·76
Wellington	2·05	1·59	14·56
Tailem Bend	2·55	1·79	14·70
Murray Bridge	1·83	1·45	13·59
Callington	2·11	1·64	15·20
Mannum	1·79	1·29	11·47
Palmer	3·87	1·60	15·43
Sedan	1·82	1·32	12·11
Swan Reach	1·55	1·24	10·60
Blanchetown	1·49	1·27	11·04
Eudunda	2·83	1·85	17·11
Sutherlands	1·35	1·21	10·82
Morgan	1·06	1·02	9·20
Waikerie	1·29	0·93	9·66
Overland Crnr.	1·16	1·09	10·41
Loxton	1·35	1·29	11·59
Renmark	1·07	1·08	10·49
WEST OF SPENCER'S GULF.			
Eucla	1·53	1·29	9·98
Nullarbor	1·13	1·26	8·73
Fowler's Bay	2·11	1·72	11·82
Penong	1·80	1·75	12·12
Koonibba	1·53	1·46	11·82
Denial Bay	1·09	1·53	11·36
Ceduna	1·82	1·40	9·95
Smoky Bay	2·05	1·40	10·28
Wirrulla	2·57	1·18	10·08
Streaky Bay	3·17	1·92	14·82
Chandada	3·09	—	—
Minnipa	2·17	1·53	13·68
Kyancutta	2·57	—	—
Talia	3·18	1·83	14·63
Port Elliston	4·53	2·06	16·39
Yeelanna	3·33	1·98	15·72
Cummins	4·20	2·05	17·35
Port Lincoln	3·99	2·34	19·34
Tumby	2·52	1·55	13·92
Ungarra	3·18	1·91	16·73
Carrow	1·97	1·39	13·08
Arno Bay	2·38	1·33	12·44
WEST OF SPENCER'S GULF—*contd.*			
Rudall	3·25	1·53	12·19
Cleve	3·61	1·75	14·66
Cowell	0·96	1·20	11·10
Miltalie	2·40	1·57	13·54
Darke's Peak	3·09	1·64	14·92
Kimba	2·08	1·34	11·52
YORKE PENINSULA.			
Wallaroo	2·46	1·87	13·91
Kadina	2·65	2·00	15·61
Moonta	3·20	1·95	15·05
Paskeville	3·37	1·90	15·46
Maitland	4·55	2·55	19·90
Ardrossan	3·01	1·69	13·93
Port Victoria	3·24	2·07	15·40
Curramulka	2·97	2·08	17·87
Minlaton	3·06	2·19	17·80
Port Vincent	2·19	1·60	14·40
Brentwood	3·51	1·88	15·45
Stansbury	4·20	2·05	16·81
Warooka	3·16	2·29	17·51
Yorketown	3·21	2·09	16·94
Edithburgh	3·02	2·03	16·34
SOUTH AND SOUTH-EAST.			
Cape Borda	4·28	3·19	24·83
Kingscote	3·39	2·51	19·11
Penneshaw	2·35	2·11	18·85
Victor Harbor	3·35	2·58	21·27
Port Elliot	3·36	2·44	19·91
Goolwa	2·25	2·20	17·81
Copeville	1·85	1·25	11·44
Meribah	1·63	1·52	11·10
Alawoona	1·47	1·38	10·02
Mindarie	2·53	1·42	11·91
Sandalwood	1·89	1·77	13·57
Karoonda	2·21	1·97	14·33
Pinnaroo	2·18	1·76	14·54
Parilla	2·49	1·71	13·90
Lameroo	2·85	1·86	16·08
Parrakie	3·23	1·84	14·49
Geranium	3·17	2·04	16·41
Peake	2·88	1·89	16·03
Cooke's Plains	1·92	1·59	15·38
Coomandook	3·10	2·10	17·11
Coonalpyn	4·26	1·88	17·42
Tintinara	5·29	2·24	18·60
Keith	4·22	2·31	17·87
Bordertown	3·95	2·07	19·22
Wolseley	4·13	2·00	18·41
Frances	5·18	2·15	19·99
Naracoorte	5·32	2·44	22·59
Penola	4·47	2·95	26·06
Lucindale	5·82	2·55	23·16
Kingston	5·01	3·06	24·38
Robe	5·22	3·05	24·64
Beachport	4·15	3·19	26·93
Millicent	4·84	3·46	29·76
Kalangadoo	5·11	3·81	32·03
Mount Gambier	3·54	3·45	30·52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		June.	July.
Adelaide	*	—	—
Allandale East	†	2	7
Appila-Yarrowie	†	2	7
Ashbourne	*	7	5
Auburn Women's	†	R	R
Balaklava	*	26	—
Balumbah	*	—	—
Balumbah Women's	1309	7	5
Beetaloo Valley	†	5	3
Belalie Women's	†	13	11
Berri	*	7	5
Belvidere	*	—	—
Blackheath	†	8	13
Black Springs	†	—	—
Blackwood	†	12	10
Blyth	*	23	28
Booleroo Centre	*	2	7
Boolgun	†	—	—
Boor's Plains	1318	1	6 & 29
Bowhill	*	5	3
Brentwood	*	1	6
Brinkley	*	7	5
Brinkworth	*	5	3
Brownlow	*	—	—
Buchanan	*	—	—
Bugle	*	13	11
Bute	*	15	20
Caliph	*	6	4
Caralue	*	7	5
Carrow	*	7	5
Cherry Gardens	†	3	1
Chilpuddie Rock	†	—	—
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* No reports received during the month of May.

† Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

[Branch Secretaries are reminded that the following are exempt from payment of the Annual Bureau subscription:—Life members, Branch Secretaries, members appointed before August 1st, 1930, and new members who reside in the same house as (a) a life member, (b) Secretary, or (c) another member who already subscribes.

The subscription for all other members is 2s. 6d., commencing from August 1st in each year, provided that—subject to the above exemptions—nominations forwarded during the months of January to June must be accompanied by a payment of 1s. 6d. each nomination for that period.]

WOMEN'S BRANCHES.

BALUMBAH.

April 12th.—Attendance, 14.

Question Box.—The meeting took the form of a Question Box:—"Should bulbs be unearthed, and why?" *Answer*: All bulbs should be unearthed as soon as the leaves are dry. If this is not done the bulbs multiply and grow too close together, causing weak and small flowers. "Why do some custards go watery?" *Answer*: This is caused through the oven being too hot and sometimes by using too much sugar. "Recipe for a Yorkshire pudding?" *Answer*: 2 tablespoonfuls of flour, 2 eggs, pinch salt, small quantity of milk. Beat until very smooth, and if possible let it stand an hour or so. Just before putting in the boiling fat add a little cold water and beat well. Bake about quarter of an hour and serve immediately. "Do watermelons ripen in May? If not, could a green watermelon be made use of?" *Answer*: Watermelons do not ripen properly in May, but perhaps jam could be made similar to watermelon jam. "How to remove ink or blood stains from colored silks?" *Answer*: Rub glycerine on the place with a soft cloth, afterwards rinsing in cold water. "Does feeding cows on hay cause them to give less milk, and a remedy?" *Answer*: If cows have gone off milk it does not necessarily mean hay feed is the cause, but a good ration is:—2 parts crushed oats, 1 part bran, 1 part linseed meal, 1 packet Epsom salts, and a pinch of super given in the feed daily. (Secretary, Miss V. Wohling.)

May 3rd.—Attendance, 15.

Sweet Pea Culture.—Miss H. Jericho contributed the following paper:—"This flower is easily grown and with a little attention will yield excellent blooms. *Preparing the Soil.*—A trench should be made about 9in. deep and filled alternately with layers of manure and soil, then well watered before sowing the seed. *Trellising.*—It is advisable to make the trellis first before sowing, because if made after sowing there is a likelihood of damaging the growing plants. A trellis made of mallee stakes and binder twine laced in between is very suitable for one season. If the trellis is required for several seasons, iron droppers and wire is suggested. Wire-netting is not so practical because the plants are likely to be damaged by the wind brushing them to and fro. The seeds should be sown about 9in. apart, during the end of March or the beginning of April, and when big enough should be tied to the first string in the trellis. Do not use cotton or thin string, because of the possibility of the plants being cut. No shoots should be allowed to grow from around the bottom of the stem, except the main one. Likewise do not allow any tendrils to lie on the ground; this spoils the appearance of the plant and tends to make the plot untidy. When the plant is about 4in. high allow two more stems to develop—one on either side, and prune any shoots other than these. If this is done, the result will be long-stemmed flowers. To obtain flowers for exhibition, do not allow any buds to develop until the end of May. Then water at least once a fortnight with strong liquid manure, at the same time suppressing any unnecessary growth that comes up from the bottom. If intending to save seeds for next year, carefully select the flowers and tie a piece of wool around the stalk. If possible select good long stalks, with four or five blooms on each; these will give best results next season. For decorative purposes the sweet pea is almost in the front rank. If picked in the morning, and the water in which they are placed freshened every morning, they will keep for a week. When placed with fern, or in massed formation, they make a striking picture. They are also very suitable for posies, because they keep fresh a long time after being picked, without water, at the same time saving the wearer the expense of perfume.'' (Secretary, Miss V. Wohling.)

COONAWARRA.

April 19th.—Attendance, 13.

Buttermaking.—Mesdames Allder and Skinner read papers on this subject from the *Journal,* and members gave the following hints:—''See that the cows do not eat any weed or food that will taint the butter. Never leave any wooden or metal utensil standing in the cream. If coloring is needed in the butter use water to which has been previously added a grated carrot. Avoid adding warm cream to cold cream. *Salting.*—Brine should be added last; allow 1 cup of water to 3 tablespoonfuls of salt for 3lbs. of butter. If salt (1 tablespoonful to 1lb. butter) is added when cream is put in the churn, the butter will keep better, the salt will not work out, nor butter go streaky.'' (Secretary, Mrs. F. Skinner.)

EURELIA (Average annual rainfall, 12.87in.).

Attendance, 8.

Fruit Bottling.—Paper read by Mrs. S. Manning:—''A fruit-bottling outfit is necessary in every home, especially for those who have gardens and grow their own fruit and vegetables. It is very simple and I have had no failures. The first essential is firm fruit. Make the syrup by boiling sugar and water together or by pouring the boiling water on the sugar. Water may be used instead of syrup, and if using water, heat the fruit with the sugar before using. I prefer the syrup, because it saves extra trouble when home-grown fruit is used. Prepare the fruit and place it in the jars, which have been three-parts filled with syrup. Then put on the rubber ring, cover, and clips, and sterilise for the required time and temperature.''

Fritters.—Mrs. E. Wall (Hon. Secretary) read the following paper:—''If fritters are cooked properly they are both tasty and digestible A faint blue smoke must rise from the pan of heated fat before any batter mixture is added, otherwise the fat will sink into the fritters and make them hard to digest. Any sweet or savory mixture can be added to a batter mixture to make fritters. If the batter is made from half to one hour before using, it will be found much lighter than if cooked as soon as mixed. A good mixture is made with ¼lb. flour, ½ cup of milk, 1 egg, and a pinch of salt. Sieve the flour and salt together into a basin, make a well in the centre and add the unbeaten egg. Work in the flour, gradually adding a little milk at a time. Beat until smooth, place a plate over the basin, and leave for ½ to 1 hour. Slices of cold cooked meat made into fritters and served hot with chipped potatoes and fried tomatoes make a tasty luncheon or supper dish. Sardines make excellent fritters, and if cooked in oil can be eaten cold with lettuce or beetroot salad. Almost any fruit can be used for making fruit fritters.''

MUNDALLA (Average annual rainfall, 19.32in.).

April 13th.—Attendance, 17.

Breadmaking.—The following paper was contributed by Mrs. W. Jones:—''Breadmaking is becoming more general in the country than it was before the depression. Everyone is striving to live as cheaply as possible, and consequently bread is being made in the home instead of buying it. Home-made bread is more economic, it is more nourishing, goes further, and satisfies one's appetite better than baker's bread. Bread is a daily food, which means that its making is a continual task, so that the simplest method is needed, otherwise one is inclined to avoid this work. The high-class recipe is no doubt good and can produce a very nice loaf, but the average housewife favors the simpler way, which, if carried out properly, will give a nice batch of bread. To obtain good bread, good yeast is essential. I prefer hop yeast made from the following recipe:—A good handful of hops steeped in ½ pint or a little more boiling water (do not boil hop water, it tends to darken the bread), 4 tablespoons flour, 3 tablespoons sugar, put in bottle, pour in luke warm hop water, shake thoroughly. In hot weather this should be ready in three or four hours; let stand longer in cold weather. Instead of all the quantity of flour, grated raw potato is good, but this is not recommended in hot weather, it tends to over-rise and make the bottle sour if used frequently. Potato water should never be thrown away, it is always valuable for breadmaking. I always put it in when mixing the sponge. To mix a dough of the right consistency some care is necessary. It should be kneaded thoroughly to remove all lumps and to avoid that streaky appearance sometimes noticed in a loaf. The quantity of salt used depends on the size of the batch. For show purposes I sift salt with flour three times. The addition of a little alum or cream of tartar

whitens and makes the bread finer. Scalding the flour will obtain a nice, soft crust after the bread is baked. Heavy bread is usually a cold weather complaint. Warm the flour in the over before mixing. I favor setting bread over night and baking next morning. I cook a 2-lb. loaf 1 hour, and larger loaf 1¼ hours. A well-baked loaf will always cut well, and keeps well. I favor baking twice a week for an ordinary sized family; for larger families three times a week. When bread is in tins and ready for the oven, stand it in a hot oven for a quarter of an hour before shutting the oven door.'' (Secretary, Miss K. Hillier.)

PENOLA (Average annual rainfall, 26.06in.).

April 5th.—Attendance, 22.

Home Economies.—*Soap Making.*—Mrs. C. Reilly read the following paper:—''The basis of all soap is the yellow, ordinary household soap, my recipe for which is as follows:—6lb. fat, 1lb. resin, 1lb. caustic soda, ¼lb. borax, 14 pints water Dissolve resin and borax in washing copper in 11 pints water, boil until resin is dissolved, melt fat, and add to resin. Dissolve caustic soda in 3 pints warm water, add to the other, and stir all together until it boils (about five or ten minuutes). It should then be thick and creamy and ready to take off. Watch it carefully when caustic and water go in, as it quickly boils over; have a jug of cold water ready to throw in should the soap boil up quickly. Leave for one week before cutting into bars. *Toilet Soap.*—Take about quarter the amount of ordinary soap from the copper and mix into it a little Lux, ¼lb. pure glycerine, ¾lb. palm olive, and stir until dissolved. Add ½lb. honey, ½lb. fine oatmeal, 2 teaspoonfuls of lavender Pour out in clean tobacco tins to set. *Sand Soap.*—Take some of the ordinary household soap and work into it fine white sand and raspings of Mount Gambier white stone. Keep stirring until nearly cold and set in tins. *Boot Polish.*—1½ozs. bicarbonate potassium, 2 pts. boiling water, 1 pt. turpentine, 2ozs nigrosene, ¾lb. beeswax. Part 1—Melt wax on water bath, then add turpentine. Part 2—Dissolve bicarbonate potassium and nigrosene in hot water. Mix Parts 1 and 2 until cold. *Boot Preserve.*—Equal parts of beeswax and mutton fat melted together is excellent for waterproofing men's and children's boots in winter. *Tennis shoes* can be cleaned with whiting mixed with boiled starch; it will not rub off. *Rubber rings* for preserving bottles can be cut from old motor tubes. A piece of ordinary strong wire turned sharply up at one end and pointed is useful for extracting corks from a bottle. *Kerosene tins* cut lengthwise and fitted with a lid make good bread or cake tins, also a lunch basket for men in the field. A home-made duco plant is useful for working over tarnished flower vases or ornaments. Chairs, furniture, or basketware can be made to look like new with this useful plant. (Secretary, Mrs. F. Kidman.)

RENDELSHAM.

April 5th.—Attendance, 12.

Cakemaking.—Paper read by Mrs. F. Todd, sen.:—''Good materials are needed for successful cakemaking. The butter firm and all gravy removed from dripping when the latter is used. Eggs must be fresh, especially for sponges. Wash all currants and sultanas and spread in a large dish to dry. When cooking for Christmas or a party, ovenslides, caketins, pattiepans, &c., can be cleaned and greased beforehand. A good sound oven is essential. *Christmas Cake.*—1lb. butter beaten to a cream, add 1lb. sugar. When well mixed, add ¾lb. each stoned raisins, currants, and sultanas, 6oz. lemon peel shredded finely, 6 bitter almonds, 1oz. sweet almonds blanched, and juice and

LIFE — A BUSINESS

It is a paradox, perhaps, that while Home Life is a refuge from business, it is itself a business.

Money enters so largely into everything that it must be planned for in every phase of life.

It is in business that money is earned, in the Home, chiefly, that it is spent, and there is no sound reason why the spending should not be regarded as being just as important as earning. In fact, it is far more important, for earning is difficult and must employ wisdom, forethought, and energy, while spending is easy, so easy that there is temptation to spend unwisely.

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grated rind of a lemon, a pinch of powdered cloves, 2 pinches powdered cinnamon, a little nutmeg, 3 cups flour, the yolk of 8 eggs beaten with a wineglassful of brandy. As each article is added to the mixture it must be well stirred. Lastly, stir in white of eggs beaten to a stiff froth and continue beating the mixture rapidly for 20 minutes. Put in buttered paper mould and bake for three hours. *Pound Cake.*—½lb. each butter, sugar, flour, 4 eggs, 4oz. each currants and raisins. Put butter in bowl and place in warm place until soft, add 2 eggs, beat well together for five minutes, then another egg, and beat again until 4 eggs are used. Then add other ingredients. Put mixture in buttered mould, well papered, and bake one hour. *Easter Cake.*—1lb. flour, 8oz. butter, ½lb. sugar, 1oz. ground almonds, 3 eggs, 1oz. caraway seed, 1 teaspoonful baking powder, a little nutmeg and vanilla essence. Cream butter and sugar and mix in the sifted flour with the beaten eggs one at a time, beat well, then add almonds, nutmeg, and seeds, lastly baking powder and flavoring. Pour in greased tin and bake in moderate oven 1¾ hours. *Sponge Ginger Sandwich.*—¼lb. butter, 2 eggs, 1½ cups flour, 1 teaspoonful each ginger and spice, pinch of nutmeg, 1 cup milk, ½ cup treacle, ½ teaspoonful soda, ½ cup sugar, pinch salt. Method—Beat butter and sugar to a cream, add eggs, then syrup. Mix in flour, lastly add milk in which soda has been dissolved. Bake in sandwich tins. *Cream Filling (artificial).*—1 tablespoonful butter, 4 tablespoonfuls icing sugar, and 2 teaspoonfuls water. Beat until it thickens like cream, flavor with vanilla. *Jam Roll.*—1 cup sugar, 1 cup S.R. flour, 3 eggs, 1 teaspoonful butter. Beat eggs and sugar, melt butter in 4 tablespoonfuls boiling water. Bake and spread with jam and roll. *Hot Tea Cakes.*—1lb. flour, ½lb. sugar, 6ozs. each butter and currants, pinch salt, 3 or 4 eggs, ½oz. soda, 1 teaspoonful cream tartar, nutmeg and essence of lemon or vanilla. Mix all dry ingredients, then add eggs and a little milk if needed. Bake in quick oven. Split and butter. *Yeast Cake* (Mrs. Spry).—1 cup flour, 2 cups yeast (potatoes), 2 cups milk, 4 eggs, 1 cup currants or sultanas, 1 large cup sugar, ½lb. butter (or ¼ each of butter and dripping). Heat butter and milk to near boiling point. Beat up eggs and sugar and a little essence. Add gradually hot milk and butter to the beaten egg and beat well. Pour yeast into centre of flour and mix like a thin sponge. Then pour milk and butter mixture around and knead well together. Let rise in a warm place. When well risen, place on a greased slide and let rise again 1 hour. Brush over with melted butter and sprinkle on the following:—1 cup each sugar and flour, cinnamon, and enough butter to make mixture crumbly. A little extra sugar, nutmeg, and cocoanut can be sprinkled after cooking if desired. Discussing the making of sponges, one member contributed the following hints:—That she always found better results in sponges by using eggs one week old in preference to fresh eggs. Also much labor is saved by beating whites to a stiff froth and then beating in the yolks one at a time. In this way as light and foaming a mixture can be had in 4 or 5 minutes as would take 20 minutes hard beating of the whole eggs. (Secretary, Mrs. E. Andrews.)

SADDLEWORTH (Average annual rainfall, 19.54in.).

May 2nd.—Attendance, 8.

THE HOUSE MOTH.—Miss G. Frost read the following papers:—"It is said that no home is free from the house moth, and, therefore, all furniture, &c., containing animal fibre must be taken care of. This insect will not attack vegetable fibre, such as calico and hessian. There are four stages in the life of the house moth. The small moth that is noticed flying around the house is the one which lays the eggs. It never flies in the bright rays of light, but around edges of rooms. It only lives 10 to 12 hours, and lays 100 or more eggs in some protected position. After laying the eggs the moth dies. The eggs take four to eight days to develop into a grub, and it is in this stage that the insect does the damage. After it has eaten what it requires it weaves a small case around itself for protection. When it moves it takes this little cocoon with it. This grub grows from 1/16in. to ¼in. in length, and remains in this condition for 40 days, sometimes longer. It then goes to a corner of a room, when it turns into a moth and thus completes the life cycle. The eggs are laid during August and the grubs are active during May and June. Most damage is done in summer, when woollen garments, &c., are put away. These latter should be stored in unbleached calico bags. The wire mattresses of beds are a favored breeding ground of the moths. A change of temperature will destroy the eggs; either the hot sun or a very cold night. A vacuum cleaner is very good for cleaning all crevices to get rid of moth eggs. The moths dislike unpleasant odors, especially those given off by camphor, turpentine, and paradichloro-benzine, the latter is most effective. It is also good for destroying silver-fish and cockroaches."

THE FRUIT MOTH.—"There are two distinct moths which attack dried fruit. One is a little larger and is more destructive than the other. They also attack all sorts of dried stored grain and fruit foodstuffs. The larger species of the dried fruit moth is closely related to the Mediterranean flour moth, which is a great pest to the flour miller in most countries of the world. In our climate the dried fruit moth breeds freely for seven or eight months of the year. During summer the moths bred out of doors, not only do they deposit their eggs upon fruit or foodstuffs, but in folds of sacks or crevices in wooden boxes. The eggs of the moths are very small, and not noticeable unless on dark background. They also breed in fruit stones. One of the principle sources of infection is in the city storerooms or warehouses, and even in retail shops. In warehouses, where fruit is stored continuously, the most damage is done. To control the pest steps should begin at the drying green, where no opportunity should be given for the insects to breed. No refuse fruit or fruit stones should be allowed to remain lying about. Sweat boxes and drying trays should be cleaned at the end of the season by immersing them in a hot bath before stacking away. Sheds should be swept and crevices brushed out. Cold storage is said to prevent the breeding of the moths in dried fruits.'' (Secretary, Miss G. Frost.)

WARRAMBOO.

Attendance, 15.

Cooking and Serving Meats.—Miss Colbert contributed the following paper:—''The tastiness of meat dishes depends very much more on the cooking than is perhaps realised. A tough and tasteless dish is often said to be the fault of the butcher, when it is really the fault of the cook. To cook corned beef, put the joint on in cold water, add a nutmeg, a pinch of carbonate of soda, and a drop of vinegar; boil and keep boiling about 40 minutes. Then push it to one side of the stove to simmer for four hours. Corned mutton can also be cooked in the same way for three hours; one hour to come to the boil and reach simmering stage. Corned pork is cooked in much the same way as corned beef. Directly the pork is taken from the saucepan the skin is removed and browned breadcrumbs sprinkled thickly over, with grated nutmeg shaken over the crumbs. Roasts of beef and mutton are put into a hot oven after the joints have been rubbed with flour and placed in a dish containing fat. After about 30 minutes the heat of the oven is reduced and the joints cooked slowly for three or four hours. An onion roasted in with the meat gives a good flavor and rich gravy. Lamb and veal are better roasted than cooked any other way. Chops retain their juiciness and flavor best if rolled in egg and breadcrumbs, then fried in deep fat. When crumb-frying, make the gravy with freshly-made tea out of the teapot instead of water. To fry plain chops, they should be put into a very hot pan with very little fat and turned

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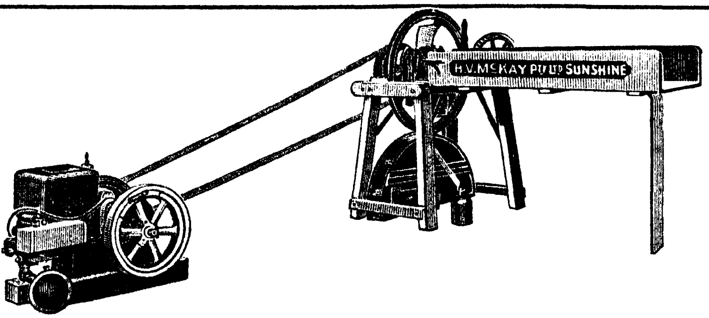
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at least four times, otherwise they will catch on the bottom of the pan and be spoilt. Steak should be fried in the same way. *Beefsteak Pudding.*—Line a mould with a light dripping or suet pastry, cut up raw steak very small, roll in flour, put into basin with salt, pepper, onions, and cover with cold water. Cover quickly with paste, tie down, and put straight into a saucepan of boiling water to steam for four hours. *Lamb's fry* should be washed in salt water, well drained, rolled in flour, and slices cooked in boiling fat and served with fried rashers of bacon. *Sausages* should be rolled in flour and well cooked or rolled in egg and breadcrumbs and fried." (Secretary, Mrs. A. Collins.)

YURGO.

April 3rd.—Attendance, 9.

QUESTION BOX.—The meeting took the form of a Question Box:—"How to get rid of red mite in poultry?" *Answer*: Use waste oil on fowl perches. "Should a fruit cake be baked on bottom of oven?" *Answer*: Yes, in a moderately hot oven. "How to remove grease from a stained board floor?" *Answer*: Pour over grease plenty of boiling water; when perfectly dry restain. "How to blacklead stove over silo-fros?" Answer: first ezywurk stove and then blacklead with blacklead mixed with beaten white of egg. "Polish for stained floors?" *Answer*: Take 2ozs. resin, ¼oz. shellac, 2 bottles kerosene; mix all together and let stand till dissolved. (Secretary, Mrs. R. Sanders.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Parilla Well ...	25/4/33	13	"Care of the Dairy Herd," J. Johnston	Mrs. J. E. Johnston
Auburn........	28/4/33	21	"Fruit Drying," Mrs. Hean	Miss L. Dennison
Gladstone......	9/5/33	—	Social	Miss M. Sargent
Goode	10/5/33	9	"Nursing," Sister Paech	Miss C. Paech
Williamstown ..	3/5/33	8	"Maternity," Miss Hammatt	Mrs. A. Cundy
Clare	1/4/33	32	Address—Mrs. E. L. Orchard	Mrs. A. Rogers
Clare	26/4/33	40	Address—Miss E. Campbell	Mrs. A. Rogers
Clare	6/5/33	17	Conference Papers.......	Mrs. A. Rogers
Warcowie	9/5/33	11	Address—Mrs. E. L. Orchard	Mrs. A. Crossman
Belalie	12/5/33	47	Social and Address—Mrs. Dolling	Mrs. F. Cummings

MEN'S BRANCHES.

SOUTH-EASTERN.

Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Allandale East .	5/5/33	10	Discussion	J. Laslett
Mundalla	12/5/33	12	Address—E. S. Alcock ..	A. Ross
Rendelsham....	13/4/33	12	Address—W. H. Downes	F. White
Rendelsham....	6/5/33	9	"The Farm Horse," E. Sly	F. White

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WILMINGTON (Average annual rainfall, 17.43in.).

April 11th.—Attendance, 13.

TO THROW A HORSE.—The meeting took the form of a Question Box. The following reply was given to the question: "How to throw a horse?":—A good strong hemp rope, about 25 yards long, is required. Double it in the middle and make a loop at that place large enough to go round the horse's neck, close behind the shoulder. This loop is placed over the horse's head and the two free ends are passed between the forelegs, one to the right and the other to the left. These ends are then passed round each hind pastern from the outside to the inside, and are carried underneath the line running from between the fore legs, then up to and across the side of the shoulder through the loop round the neck. The assistant on the right side stands in front of the horse and the one on the left stands behind. The side lines are then hauled tight, which has the effect of pulling the hind feet up towards the chest and thus the animal is thrown. During this operation the head must be kept well back. The hind legs are then made fast by pulling the feet forward close up to each side of the chest and making a hitch round the pasterns. The forelegs are then secured by passing the rope round each pastern at their respective sides and tying them to their hind pastern.

Methods of Combating Rabbit Pest.—This subject was also discussed. A good method is to shut off the rabbits from water, and put out a few tins of water poisoned with cyanide of potassium. This can also be used for fumigating, by throwing a piece down the burrow, then blocking all openings. Fumigating with carbon bisulphide is also effective; this is best carried out in winter, because the ground is then not so porous. Some people favor trapping and filling in the burrows. The poison-cart is used on large holdings, but there is a danger of sheep picking up the baits. Oats dipped in a solution of strychnine and sugar, also raspberry jam and strychnine put on sandalwood sticks are very good baits. Phosphorus and pollard and S.A.P. are used, but both are liable to start fires if not properly mixed. It is impossible to completely destroy all rabbits by any one method, but it is necessary to meet them at all points. Poison them when possible, use dogs, guns, traps, ferrets, and keep at them; this is the most effective mode of combating the rabbit pest. (Secretary, P. Cole.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Warcowie	9/5/33	24	Address—E. L. Orchard .	A. Crossman
Morchard	—	10	"Farm Efficiency," A. McCallum	A. McCallum

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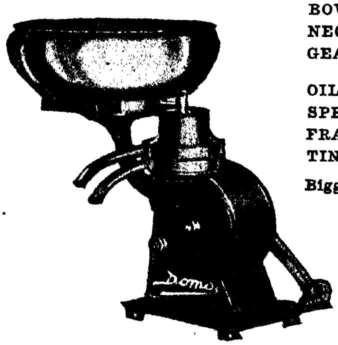

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MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

MURRAYTOWN.

April 8th.—Attendance, 9.

THE FARM TEAM.—Mr. N. Scholz read the following paper:—"At the present time practically all power farmers are reverting to horses. A few years ago a young draught could be purchased at from £15 to £25 according to size and quality, but now horses of the same age are selling at from £30 to £40, and the farmer who continued breeding throughout the slump period is reaping the reward he richly deserves. The best and cheapest method of replacing aged horses is by breeding young stock. The best mares should be selected for this purpose—a mare that is well proportioned, docile, and a good worker. The mares should be put to the best stallion in the district. Young stock will be of a better class and easily worth the extra fee. When the mares have been served, they should not be worked immediately afterwards, but put in a vacant stall or yard, where they will not be molested by the rest of the team. If one is prepared to put up with the bother, keeping a stallion is a good proposition, providing one has enough mares to warrant the expense. He should be put to work, and by working the stallion he is kept healthy and is less likely to get foundered or break out in sores on the legs from over feeding. Still more important, he will be found more reliable and healthy—a foal-getting sire. Both the Clydesdale and Percheron are suitable breeds of horses for farm work. Work the mare until within a week of foaling time. The foal should receive every care from infancy, the mare given good feed, and, if possible, not be worked until the foal is weaned. When weaning the foal, do not give too much chaff at a time, but feed often with an occasional feed of hay; provide plenty of drinking water. The team should be housed in a good stable—one that is cool in summer and cosy in winter. I prefer an iron stable because it is cleaner, less work is attached to its maintenance, and there is less danger of fire. In the stable pegs should be provided on which to hang the collars, so that during the night the sweat from the previous day will dry. The horse trough should be located two chains from the stable and be easily accessible to the horses. Feed and groom the team regularly. When working, they should be fed four times a day—not too much at a time, but of good quality. A lick should always be available, and one can be prepared in the following manner:—Common salt, 9lbs.; superphosphate, 18lbs.; slaked lime, 2½lbs. Mixed together and placed in a box this will prevent horses eating manure." During the discussion Mr. Joppich said that if one was breeding it was important to see that the sire was good tempered as well as the brood mare. He thought the working horses should always have their shoulders kept clean. Mr. Reichstein said that many of the Clydesdale stallions were too far forward on the fetlocks for heavy draught work. Mr. Borgas said the easiest and most convenient way to clean the horses was per the medium of a good straw stack for them to rub against at night. If very sweaty and dirty, then a brush should be used on them. Mr. Starr said the cleaning and grooming of horses was as important as feeding, especially keeping the shoulders clean. He expected to see the price of horses fall in the near future. Mr. W. Scholz said in breeding the temper of the stallion was quite as important as that of the mare. Members stated that last harvest's rusty hay was not proving of much value for feeding; horses did not "pick up" on it, even if not working. (Secretary, E. Pitman.)

YANDIAH.

April 21st.—Attendance, 12.

THE PRODUCER GAS TRACTOR.—Mr. A. O. Klemm read the following paper:—"When seasons were good and wheat prices were high, tractors on the farm were a paying proposition and were soon numerous in many wheat-growing districts. In the last few years the price of wheat has fallen, but the cost of production is still high. The farmer who has to depend on power farming is in a worse position than his neighbor who depends on horses. Hay and chaff are cheap and can be produced on the farm, but tractor fuel has to be imported and at a high price. To run a tractor on kerosene does not seem a payable proposition. The farmer with a crude oil tractor has a decided advantage over the one with a kerosene tractor, because the price of crude oil is only about half that of kerosene. The farmer with a kerosene tractor is in an awkward position. To go back to horses is not so easily done, for horses are too dear to buy at present prices, and his only alternative is to look for cheaper fuel. The cheapest fuel on which a tractor can be run is charcoal gas. To do this the tractor must be equipped with a gas producer. The gas producer which has given the best satisfaction up to date is the Slattery patent. The alterations necessary for a Holt tractor are higher compression, obtained by having longer pistons installed, to advance the spark on the magneto, to alter the gear race by taking out the top gear, and putting in an intermediate gear to work between the low gear and the working gear, and to increase the revolutions of the engine up to 1,400 or 1,500. If this is done very good results will be obtained. A farmer who works a gas producer will not, however, have a 100 per cent. advantage; he will take longer to get a start in the morning and he will not find it so convenient as kerosene. The tractor loses about 25 per cent. of its power. Some mornings the gas producer has to be cleaned out; it takes a few minutes to get the charcoal alight and the engine filled with fuel and water. Occasionally there is no trouble to change the engine over to gas, but this does not result in a great loss of time. For the first few chains on gas the engine does not develop full power; this is also a disadvantage. However, once started there is no need to stop, for the engine will run a full half-day without refuelling, but water may have to be filled in the scrubber. Another disadvantage is that it cannot be throttled down, as it is not fed through the carburetter. It cost me about 9d. or 10d. per acre to plough last year. The tractor used a lot of oil and from four to five bags of charcoal per day. When the day's work was over one could look back with satisfaction when it was realised that it had been done for a few shillings and then live in hopes that some day the gas producer would be 100 per cent. efficient.'' (Secretary, F. Jettner.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Yandiah	14/3/33	29	Address—H. B. Barlow .	F. Jettner
Appila	8/5/33	11	" Power on the Farm " ..	E. Wurst
Beetaloo Valley	8/5/33	14	Address—W. Aird, and Social	B. Giddings

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

WASLEYS.

April 13th.—Attendance, 17.

NOXIOUS WEEDS.—Discussing a paper on this subject, which was read at the Lower North Conference, Mr. E. Fischer thought it was necessary for the people of this district to see the various serious noxious weeds, such as hoary cress and wild mignonette, so that they would be able to eradicate them whenever they saw them. Mr. Sellick said that weeds such as Salvation Jane should not cause much trouble in this district because of intense cultivation, but wild mignonette would become a great pest if not attended to. Mr. E. Day said there should be a set period for the cutting of noxious weeds. It was difficult to deal with star thistles, because if they were cut off they grew from the roots the next year. Mr. M. Richter gave a resume of the discussion on this paper at Auburn. (Secretary, C. Currie.)

May 11th.—Attendance, 32.

QUESTION BOX.—The evening was devoted to a *Question Box*:—''Should not the South Australian merchants be more careful as regards the standard of wheat for overseas?'' *Answer*: Members considered the merchants were to blame that inferior wheat was received; without dockage there was no incentive for the farmer to market a clean sample. Bulk-handling—whereby wheat was purchased according to grades—would overcome the present difficulty. ''The results of the use of 100 per cent. super.'' Answer: Two members had used it, but had not given it a thorough test, as it had been sown in paddocks where the remainder was sown with 48 per cent. super. In one instance 70lbs. was sown and the other 56lbs., and so far as the eye could judge there was no noticeable difference at harvest time. However, the general opinion was that the first expense was rather great, and if a reduction of about £3 per ton was made more of it would be used, because there was less handling and less tons on which to pay freight. ''Sore shoulders in horses?'' *Answer*: It was considered if care was taken with the collars no sores would be caused, but wattle bark powder was very effective. ''Does it pay to use manure containing sulphate of ammonia in proportion of 3 to 1?'' *Answer*: This practice was thought advisable if sowing wheat on stubble land, and providing a good yield was obtained. ''Is it detrimental to a crop sown with a tractor using spade lugs as against horses tramping and packing the land?'' *Anwer*: It was thought that no difference would result, but the blade grips when working wet fallow were not to be recommended, because they packed the land to such an extent that the combine would not stir up the tracks; the spade lugs did not do this. ''What is the easiest method to clean the star feeds of a combine?'' *Answer*: A strong caustic soda solution; care should be taken not to put the hands into it. Other methods were: To put fine river sand in the drill before starting or putting machine in motion before filling with super. An old rasp was also very effective for cleaning the stars. "Worms in poultry?" *Answer*: A member had used capsules with very good results; Epsom salts in drinking troughs was also recommended. (Secretary, C. Currie.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Penwortham ...	20/4/33	9	Conference Reports......	A. Jenner
Black Springs ..	25/4/33	12	Address—W. Aird.......	K. Dunn
Light's Pass....	10/4/33	7	Formal	E. Verrall
Lyndoch.......	9/5/33	13	Discussion	J. Hammatt, Williamstown
Stockport	12/5/33	16	Address—W. C. Johnston	L. Klaffer
Upper Wakefield	4/5/33	11	Address—W. J. Spafford	C. Neumann, Halbury
Truro	15/5/33	14	Discussion	L. Davis
Owen	10/4/33	8	Address—W. C. Johnston	M. Freebairn
Rosedale	8/5/33	11	Address—R. Hill........	S. Sincock
Snowtown	12/5/33	12	Question Box	A. Hocking
Roseworthy ...	10/4/33	13	Lantern Lecture—W. J. Spafford	S. Bowden
Roseworthy ...	8/5/33	24	Address—T. Brinkworth	S. Bowden

YORKE PENINSULA DISTRICT.

BOOR'S PLAINS (Average annual rainfall, 15.61in.).

May 4th.—Attendance, 16.

THE USES OF CEMENT AND CONCRETE.—Mr. G. Smith contributed the following paper:—*Concrete Floors.*—Concrete made from lime, stone, and sand can be used for floors, but this mixture is not recommended where there is any heavy work on the floor, such as in a blacksmith's shop. It is advisable to mix this concrete fairly wet the previous day before laying; the lime will more likely be slack, and the finished job not so liable to crack, and thorough ramming while the concrete is still wet is necessary. This concrete is not the best to use if it is intended to finish the work with a coat of cement on the surface, because cement does not bind well with lime. The most suitable solid floor is cement concrete. The ingredients required for this are good clean sand and small stones. Sharp beach sand is the best to use, because it is free from dirt. If it is intended to finish off the floor with a coat of cement, the mixture need not be strong, about six of sand and stone mixed to one of cement; and for the finishing coat, three parts of beach sand sifted to one of cement. Both sand and cement should be well mixed dry, before adding water. Care should be taken not to mix too large a quantity at a time; the sooner cement is used after mixing the better. *Paths.*—In making paths, either of the above mixtures can be used. For reasonable service, concrete made from lime, stone, and sand is advised. This class of path is cheaper, although cement concrete makes a more lasting job. *Cement Tanks.*—On most farms water tanks get holes in them, and are past repairing with a soldering iron. These can be made into good serviceable tanks again by coating them, either inside or outside, with cement. If done on the inside, the tank must be clean and dry. Clean the tank well with a stiff broom or wire brush, and if wet wipe it well with bags. The holes in the iron can be covered with pieces of galvanized iron, cut a little larger than the hole itself and fastened with gutter bolts. Another way of closing up the holes is to glue pieces of hessian over the openings. To cement the tank, always start from the top and work a strip, about 1ft. or 18in. wide, right around; Continue working strips this width until the bottom is reached. If the tank is too wet near the bottom, wipe it with a bag and dust with dry cement. If started at the bottom and worked upwards, the moisture will work down and make the first lot too wet, and in all probability it will come off the tank. Two coats of cement are required, the first is put on just thick enough to cover the corrugations. The second should be put on the next day, starting from the top and working the same way as the first coat, putting the bottom in last. To put in the bottom, work right around the tank and finish in the centre; have two pieces of board, one to stand on to finish the centre, and the other to stand the ladder on, so that you can get out. Do not move the boards when finished; they will leave the cement when dry. In mixing cement for this work, good beach sand sieved to remove all stones is necessary. The mixture required is two parts of sand to one of cement, and it should be well mixed dry before adding any water. Care must be taken to see that it is not too wet for this work, or it will not stick to the sides of the tank. Do not mix too much at a time, because the longer it is mixed the harder it is to work. A 2,000gall. tank will take about six bags of cement and six bags of sand. Cost of materials: Cement at 8s. 6d. bag, £2 11s.; sand at 1s. bag, 6s.—£2 17s. Labor at 10s. 6d. day (two days), £1 1s.—total, £3 18s. Old water troughs can also be made serviceable by giving the sides two coats of cement. The ends should be covered with wire netting and two coats should be put on the inside and two on the outside. The same quantities of cement and sand should be used for troughs as used in the cementing of tanks. In using cement for all work it is best to do it in cold weather. The cost of cementing a trough 27ft. x 18in. would be:—Cement, 3½ bags at 8s. 6d., £1 9s. 9d.; sand, 4 bags at 1s., 4s.; labor, at 10s. 6d. a day (two days), £1 1s.—total, £2 14s. 9d. (Secretary, S. Chynoweth.)

WESTERN DISTRICT.

ELBOW HILL (Average annual rainfall, 11in. to 12in.).

March 7th.—Present: 16 members.

Best Methods to Grow an Ideal Crop of Wheat in the Elbow Hill District.—Mr. W. Cooper (Hon. Secretary) read the following paper:—"The first essential is good fallows. The land should be ploughed as early as possible after seeding—in June, or not later than July. The earlier the better, in order to obtain the benefit of all the rain that falls in winter. The benefit of early fallowing can be noticed if a 250-acre paddock is fallowed by keeping on ploughing right around until the centre is reached, and then to plough across the headlands—the beginning of the headlands will be quite dry, but the further this work is continued the wetter the ground becomes until the outside is reached, which will be quite wet compared with the dry soil in the centre of the paddock. The outside ploughing has a month's rain stored up, but such is not the case in the centre. It is not advisable to plough deeper than 2½in. The type of plough to use does not make much difference so long as all the soil is completely turned over and no strips left between the furrows. If strips are left the weeds grow exceptionally well on these, and, if not fed off, will run to seed. Any weeds that do grow should be kept down by sheep. The fallow should be left in its

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rough state until the winter has finished, when it should be cultivated to destroy all weeds. The shallower the better, so long as the shares cut all the weeds. A firm, solid bottom is to be aimed at. The fallow should be well worked if there is plenty of rain and weeds make their appearance. Cross working is advisable, it gives a more even cultivation of the soil, and the implement does a better job. If rain falls in autumn a cultivation then will work wonders with the soil, even if very few weeds are growing on the land. It is one of the most important times in the periods of the cultivation of the land. With well-worked fallow weeds will not be so difficult to control at seeding time. Providing the fallow is in good condition, the selection of seed wheat is most important. For an average all-round wheat Nabawa holds pride of place in this district, and the largest acreage on the farm should be sown with this variety. It yields on the average as well, if not better than any other wheat. It resists flag smut, whereas Gluyas—another popular wheat—is very susceptible. The wheat should be free from smut and well cleaned or graded to rid it of weed seeds and foreign matter. For pickling the dry method copper-carbonate is recommended, it does not injure the grain like the wet pickles. Dry pickled wheat, when sown, grows as soon as unpickled wheat. Wet pickles retard germination and kill damaged grains. This makes the crop much thinner. If the seed is free from smut, and is pickled, there will be no smut in the following crop. If there is, faulty pickling is to blame. The amount of seed to sow to the acre—usually from 50lbs. to 60lbs. to the acre—is quite sufficient. Well stooling wheats need not be sown as thick, 50lbs. is sufficient; but for a wheat like Gluyas, which does not stool to any extent, 60lbs. is the best amount to sow. 60lbs. of high grade super is recommended, and that amount will grow 40bush. to the acre in this district if there is sufficient rain. The time of sowing is important. The month of May is, on the average, the best time to drill. Seeding should be completed by the first week in June. Wheat sown earlier than May usually grows a good crop of straw and not enough grain. For sowing the wheat the present method by the combine is ideal. The seed is sown on a firm seedbed, which is a very important factor. I do not favor new shares on the combine, because the points stick too far into the ground, causing unevenness of the seedbed. Shares that have the points worn off do a much better job. The seed should be sown as early as possible. There is less danger of the grain malting and a better crop will grow from shallow seeding than deep seeding. The lever should be set so that it will cut all weeds. If the land is in right condition, harrowing after the combine will improve the crop, but if the soil is light and is likely to drift, harrowing may not be advisable.'' Mr. P. Wake, in discussing the paper, thought 60lbs. of super to the acre was not enough for sandy land. It was necessary at times, when dry weather prevailed, to sow the seed a little deper where the soil was wetter. Mr. S. Wade said if he had a large area to sow he would start seeding with 30 or 40 points of rain during April. He did not consider the combine the ideal implement for seeding. The perfect implement was not yet made. Mr. G. Wake would start fallowing at the end of May and complete it if possible by the end of June. The soil retained more moisture by fallowing early. Late fallowing in September was detrimental. One might just as well not do any fallowing at all as to do it then. He believed in waiting for rain to start seeding, even if the season did not break until June. Mr. G. Rehn stressed the importance of the Bureau from an educational standpoint. It tended to make farm life more attractive. This Branch was fortunate in having up-to-date farmers as members. He quoted some of his experiences in farming on the Franklin Harbor flats in the early days. Mr. J. Wildman said the combine was not yet perfect. It did not allow the seed to fall right on to the seedbed. Mr. W. Cooper believed in waiting until May 1st to start seeding. He considered the combine the best implement for seeding. He favored shallow fallowing. Deep ploughing encouraged take-all. He was a great believer in the use of the harrows on the fallow. Mr. A. Story said he would not use the plough for fallowing if the cultivator would do. 50lbs. of seed wheat was sufficient to sow to the acre in this district. He believed in waiting for rain, if possible, and sow when the ground was wet.

GREEN PATCH (Average annual rainfall, 26.56in.).

May 4th.—Attendance, 21.

Scholars from the Port Lincoln Agricultural High School were responsible for this meeting, and contributed the following papers:—

Pasture Improvement (N. Hyde).—''To establish better perennial grasses and clovers in cultivation paddocks or on old pastures, it is necessary to plough and harrow the land during spring and summer. It should be worked occasionally to sweeten and conserve moisture. If the ground is free from weeds, sow late in March or early in April. This should be rolled, because the seed must have a firm seed bed. The typical summer-growing grasses, like Paspalum and Rhodes grass, are best sown in spring. Seeing that so much grazing land in our areas of good rainfall is of a hilly and more or less broken nature, with stony outcrops, methods of pasture improvement which disregard the plough as practicable aid, must be considered. Much of this land has already been cleared of the original timber and scrub, so that it is necessary to seek a way of improving this type of pasture land by scattering about hardy types of grasses and clovers anywhere a little cover may be obtained. Such varieties must be of a quick spreading nature. It is not to be expected that a perfect pasture of introduced grasses and clovers can be speedily obtained by these means, but a sure and steady improvement in the carrying capacity and feeding value will soon be apparent. In the driest areas, scatter a little Subterranean Clover and Wimmera Rye grass in the ashes of burnt logs, and good stands can often be obtained. To improve pastures where the contour is too rough for ploughing, use fertilizer. Within reason, and subjected to pasture management, the more heavily a pasture can be stocked—provided we supply the food needs of the grass—the freer from weeds and foreign growth the land will be. Pasture management entails spelling the paddocks after heavy stocking. Constant heavy stocking on the same area is wasteful, and will depreciate any pasture quickly. Stock and spell alternately must be the slogan in pasture management.''

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Further particulars can be obtained from the Manager, Parafield Poultry Station, Salisbury, or Poultry Expert, Department of Agriculture, Flinders Street, Adelaide.

C. F. ANDERSON, Poultry Expert.

Feeding Cows for Milk Production (R. Mitton).—"Cows are looked upon as a profitable side line if properly fed, well cared for, and carefully handled. Cows fed on grasses and clovers get the best food for milk production. A cow when in full milk requires about one-tenth of the weight of her own body per day in food; *i.e.*, a cow 1,000lbs. live weight requires 100lbs. of grass and clover or its equivalent in other foods per day. When clovers are in bloom, and before grass seeds ripen, a cow's food is practically a balanced ration, *i.e.*, it consists of about 75 per cent. water and 25 per cent. of dry matter. This dry matter consists of 10lbs. indigestible and 15lbs. digestible food, the latter being dissolved by the glands and cells of the stomach, absorbed by the blood streams, and carried all over the body. Of the digestible food, 12lbs. is carbo-hydrates, 2½lbs. protein, and ½lb. fat. This is a balanced ration, *i.e.*, the different foods that can be made use of by the cow. Carbo-hydrates consist or carbon and water in food, represented by sugar, starch, and gum. Fat or oil is used for the same purpose, but a given weight is two and a half times the food values of carbo-hydrates. Protein is the most important part of the food, and contains nitrogen, phosphorus, sulphur, and lime. The secret of milk production is to provide food containing sufficient protein. For every ton of maize assimilated, 1½ tons are wasted passing through the system unused. As it is impossible for a cow to eat more than 100lbs. of green maize a day, she cannot be fed on maize alone, as she could not eat enough to provide her with the right amount of protein to keep up her milk flow. When fed on lucerne, she would givo her full milk supply. If the food of the cow increases in carbo-hydrates, she should increase in butter fat. A cow giving a greater amount of rich milk will need more protein from which to manufacture her milk. It is found for heat, energy, and renewal of waste tissues a cow needs for every 100lbs. live weight .07lb. protein, .7lb. carbo-hydrates, and .01lb. fat. A cow giving 30lbs. of 4 per cent. milk per day would need for milk producing purposes 30 times the nutriments as said before. If a cow is grazing on grass, she needs a few pounds of rich food in protein to keep up her flow of milk. If all of these foods are given to a cow and she is well looked after, it should prove very profitable for milk production."

Reasons Why Farmers Should Keep Books (— Bassom).—"Farm accounts to be really useful are by no means easy to keep, inasmuch as many of the entries must necessarily be estimates rather than statements of actual transactions. The operations of each branch are so dovetailed into those of others that it requires keen discrimination to ascertain the percentages of profit or loss to be allocated to it. But however difficult bookkeeping may appear, it should be remembered that an actual knowledge of his financial standing is as important to the farmer as the state of his crops. The conditions of agriculture have changed; things are cut much finer, competition is keener, and details of leakages must be watched far more closely than was necessary in the so-called "good old days." This is an age when brain must supplement, if it does not replace, brawn, and success is far more likely to attend the steps of the farmer who does not neglect this important part of his operations. *Reasons for Keeping Accounts*: The following is a summary of the reasons for keeping accounts in a business-like fashion:—1. It is our only way of knowing whether the farm is being run at a good profit, at a small profit, or at a loss. 2. It enables profit and loss to be traced to a certain department of the business. The expense may be too high, the livestock may not be paying, a certain crop may be grown at a loss, or perhaps one section is paying well and the other is not, and there is no indication where the leakage or the profit is. All these things would be told by a set of books. 3. It tends towards economy of expenditure by keeping the expense account continually in view, and may reveal to the farmer who is discouraged because his farm 'doesn't pay' the fact that it is paying well, but the profits are all being consumed by extravagant management or living expenses. 4. It enables the elimination of the sources of loss by the abandonment or improvement of those branches which are being conducted without profit, and the development of those branches that show the greatest margin of profit. 5. It makes a handy compendium of particulars—a diary, a memorandum, a reference as to the dates and crops, profits and transactions—which will be a source of much satisfaction, and may become important evidence in a case of litigation, or may even prevent it by furnishing indisputable proofs. In addition, attention is directed to excessive expenses or to possible economies. Small items often amount to a considerable total, and this attracts attention in a way that individual items would fail to do. In this connection it may be doubted whether many farmers, except those who keep regular books, have any definite knowledge in regard to the amount of their private expenses or cost of living. Their business and private moneys are rarely kept separate, and in many cases what is left over after the business and private expenses have been met is looked upon as representing the whole of the profits from farming. Undoubtedly many farmers are securing larger profits than they themselves realise, owing to their private expenses being in excess of what they estimate."

WEALTH FROM THE COW AND HOW TO INCREASE IT (D. McBeth).—"The various economy measures which are being put into practice throughout Australia to-day will not, in themselves, bring us back to our former prosperity. It is essential that these measures be accompanied by very decided efforts to increase production, and particularly the production of exportable goods—also to obtain this exportable production as cheaply as possible, in order to be able to compete in the world's markets. The bulk of Australia's wealth has its basis in livestock. If we could increase the actual earning power of each animal without materially increasing the overhead expenses associated with it, we would go far in lifting our country from the slough of financial despondency into which it has fallen. The primary industry which to-day leds itself more than any other to stimulation, without materially increasing the capital involved in it, is undoubtedly dairying. The value of the dairying industry in Australia is to-day slightly greater than the value of the wool industry. It has been stated in the recent report of the Federal Dairy Investigation Committee, that tremendous scope for cheap increased production is awaiting exploitation in the dairying industry. If the production of each cow was increased by only 10lbs. of commercial butter per year—a very simple task—the additional revenue would amount to no less than 1¼ million pounds sterling. This fact needs a little explanation. The average production of butter fat per cow in New South Wales, Victoria, and South Australia is only 130lbs. per annum, which, on to-day's price of butter, is equivalent to a gross earning power of £6 10s. per cow per year. If the low-producing herds adopted, even in a small measure, the principles of feeding, breeding, and management employed in the high-producing herds, the production of commercial butter could be increased enormously. The cost of such increase would hardly be noticed against the greatly enhanced returns. *Feeding and Breeding.*—These principles of correct dairy management are few and simple. The first is correct and adequate feeding, embodying the essential factor that the ration must be balanced. The second is that the daily production per cow must be watched, and the 'passenger' cows culled from the herd. The third is that the herd bull should be of high-producing stock, in that the heifers he gets should be higher producers than their dams. Such a bull is termed a bred-for-production bull. The last is that the heifer calves from the best cow should be carefully reared and kept under good conditions until they come into profit. If stunted in their early

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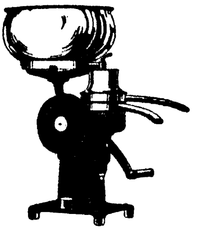

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life, they will not develop into high producers. There is no shadow of doubt but that a combination of breeding from production-bred bulls, culling out the passenger cows, together with correct feeding, is an absolute assurance of considerably increased production and profit. Very few farmers understand exactly the meaning of balanced ration, although most farmers recognise that a balanced ration is essential for maximum production. Although highly technical in sound, formulating a balanced ration is simple in practice. It is just a question of providing the cow with food which supplies protein and carbo-hydrates in their correct proportions, protein being the food element forming the greater part of milk, and carbo-hydrates being productive of body fat and energy. *Balance of Rations.*—The great majority of grasses, in their young growing state, are well balanced, and as a consequence production is highest during those months. During winter, the bulk of the pasture in dairying districts is ineffective, because it is a dormant period of growth. The fodder crops usually fed, such as maize, &c., either green or as ensilage, together with cereal or meadow hays, are principally sources of carbo-hydrates. The result is that nine out of ten dairy rations are deficient in the important milk-producing factor—protein. Deficiency of protein not only robs the cow of her producing capacity, but it adversely affects the digestion of carbo-hydrates, thus causing poor condition. The first progressive step in feeding should be to ensure an adequate supply of protein in the ration. The farmer who has lucerne, clover, cow peas, &c., can materially improve his ration by feeding these legumes. The farmer who has not these protein fodders must purchase concentrated food to supply his needs. In addition to the usual daily ration of 25lbs. to 40lbs. of farm-grown crops, such as green maize, &c., the cow should receive a concentrate ration supplying the essential protein. Probably the best and cheapest means of doing this is to prepare a mixture of two parts bran and one linseed meal. Treat this mixture as a producing ration. Its cost would be approximately ¾d. per lb. Feed this ration at the rate of 2lbs. per cow per day for every gallon of milk she produces. As she increases in production, gradually increase the allowance, until she fails to respond. She will then have reached her hereditary maximum capacity, after which point it is useless to increase the ration. So effective is the principle of balancing the ration that many cases of doubling production can be quoted.''

SILAGE AND ITS MAKING (— Cowley).—By converting into succulent and nutritious fodder material such as surplus grasses and herbage that would not otherwise be used, silage effects a saving which, if the practice was universal throughout the State, would be of almost incalculable value, the more so as silage can be made almost everywhere in South Australia. It is inexpensive, even though the cost of installing a silo in the event of one being necessary may seem to some to be large. A brief survey of the losses of stock, and of money paid for fodder at famine prices, will soon bring conviction as to the wisdom and economy of the practice of silage-making. There is no possibility of waste, even though the silo remains full for several years because of good seasons. A silo will also enable feed to be utilised that by reason of a rainy season cannot be converted into hay. Altogether it is estimated that the use of silage will increase the carrying capacity of an ordinary farm by 25 per cent. The fermentation of plants is mainly due to the action of micro-organisms, and the principle of making ensilage is to encourage the actions of these germs up to a certain stage, which having been reached, to check or destroy them. When green plants are heaped together, fermentation soon begins, and the temperature causes a very great development in bacterial activity, and fermentation proceeds very rapidly until the temperature goes somewhat about 125° Fahr. When a temperature of about 140° Fahr. is reached, many of the organisms that have produced fermentation are destroyed, and hence fermentation proceeds less rapidly until a temperature of about 160° Fahr. is reached. When all the organisms are destroyed and spores, or seeds, only remain alive, fermentation then stops, and not until the temperature decreases considerably and the air gains access to the fodder, can secondary fermentation begin. Thus by packing tightly and preventing the access of air, putrefactive decomposition is held in check and the fodder is preserved. Sweet silage is obtained by filling the silo slowly, thus allowing oxygen to remain in the heap to enable the heat-loving organisms to set up a brisk fermentation, forming considerable heat, and practically checking all fermentation and decay. Sour silage, on the other hand, is made by rapidly filling the silo. This excludes the air, which in turn decreases the amount of chemical change and keeps down the temperature. Silage by itself is not a satisfactory fodder for dairy cattle, and should be mixed with clover or lucerne to get the most satisfactory results. Roughly speaking, 3 to 4 tons of silage is equal in food value to 1 ton of average hay. Ensilage, however, has certain advantages over hay-making:—(1) It is cut and immediately stacked; there is no drying, and rain will not affect it. (2) It will last indefinitely. (3) Many crops unsuitable for hay can be used, and weeds such as thistles can be cured and have been successfully utilised.'' (Secretary, C. Whillas.)

KYANCUTTA.

May 2nd.—Attendance, 14.

QUESTION BOX.—The meeting took the form of a *Question Box.* The following subjects were discussed:—"Is it correct that softshell almonds must have hardshell almonds grown with them before they will bear?" *Answer*: Messrs. M. O'Brien and G. Schwerdt were of the opinion that it was not necessary, both giving instances of softshell almonds growing without hardshells near and bearing. Mr. K. Dyke said that some varieties of softshell almonds were self-fertilising and others needed fertilization. "Does any member present favor formalin in preference to bluestone for pickling wheat?" *Answer*: Mr. G. Schwerdt favored formalin because there was less danger of wheat malting than after being pickled with bluestone and that it was a better fungicide. Mr. R. Holman always used bluestone and was never troubled with smut or malting. "If a mare is served by the horse nine days after foaling, will she take the horse again that season whether in foal or not?" *Answer*: Mr. Schwerdt said if the mare was not in foal, she would come in season at regular intervals, but there might be a rare exception to the contrary. "What breed of fowls is most suitable for farm sidelines in this district?" Answer: Mr. W. Little favored Black Orpingtons; they were good layers, good table birds, and did not get into mischief like the light breeds. Mr. Schwerdt favored Indian Game crossed with Silver Wyandottes for general utility fowls. "Is crushed wheat in large quantities injurious to mares heavy in foal?" Answer: The general opinion was that it would be injurious and also likely to cause founder. (Secretary, J. Dyke.)

LAURA BAY.

April 11th.—Attendance, 16.

BUTTER MAKING ON THE FARM.—Mr. W. Bowell read the following paper:—"To make good butter, one must be scrupulously clean and pay the strictest attention to every detail. The success or failure of the buttermaker begins at the milking yard or shed; these should be perfectly clean. The hands of the milker should be as clean as possible, the cow's udder and teats washed and the milk bucket scalded with boiling water before starting to milk. The milk should be separated at about blood heat, and the cream run into a clean basin and allowed to cool before mixing with the previous day's cream. Mixing warm and cold cream invariably means second-grade butter. After separating, wash the separator, strainer, and bucket in lukewarm water, then scald with boiling water or steam jet. Always use perfectly clean dishcloths and towels for washing all utensils used in connection with milk or butter. The slightest trace of foreign matter gives the bacteria—which spoils milk and cream—a chance to get to work and spoil the chance of making good butter. Churn the butter at least twice a week in winter and three times in summer. Just as the buttermilk begins to come freely, pour in about 1 pt. of salt and water; this helps to remove the buttermilk. Pour off the buttermilk, wash the butter in three lots of cold water, then add and work in the required amount of salt. Take the butter from the churn and work thoroughly on a sloping butterboard with a piece of clean linen. The butter should be weighed and shaped into pounds and wrapped in butterpaper. Use butter pats for shaping. Good butter should cut down clean with a knife and with a twist of the knife should break. The butter should never be touched with the hands from the time it leaves the cow until it is handed to the customer. The dairy should be kept at an even temperature, never rising above 70 degrees, and must always be kept clean and wholesome. Do not keep anything in the dairy that has an odour likely to taint the butter. Onions or stale cabbage quickly taints dairy products." (Secretary, W. Edson.)

MOUNT HOPE.

April 4th.—Present: 12 members.

CARE AND MANAGEMENT OF THE HORSE.—Mr. R. Myers read the following paper:—"Under present economic conditions the horse is again called upon to supply the power on most farms, and those farmers who stuck to horses right through have shown considerable foresight by so doing. One of the first essentials of the horse breaker is that he must be even tempered, no matter how obstinate the colt may be. The disposition of a horse driver is nearly always reflected in his team; if the driver is good tempered and always treats the horses gently, but firmly, he will get much better results than by knocking them about. Plenty of good feed and clean water are the main points in keeping the team fit. Other factors of minor importance is the observance of the following:—Do not overload the team. Do not try to make eight horses do the work of 10. Do not work too long hours. If the team starts to lag, knock off. If the team has been spelled on grass and hard work, such as fallowing is to be started, work short hours for a few days. See that all harness fits well, especially collars, and the hamehooks should not be too low, or the draught will come too much on the point of the shoulder. Swingletrees should be made on the advantage principle. Nothing is more distressing than to have a big horse on one end and a small one on the other of an equal swingletree. If swings are made properly the weaker animal can be given the advantage. Always let the team have access to salt lick, and green feed in season is a good change to stable diet.'' (Secretary, A. Myers.)

PYGERY.

April 4th.—Present: nine members.

Harvest Reports.—Mr. G. Symonds reported:—Rainfall for year, 14.65in.; April to October, both months inclusive, 11.52in.; Nabawa on fallow best wheat, 15bush.; Early Gluyas and Waratah on fallow, 12bush.; Gluyas after oats last year and fed off, 12bush. Mr. R. Woodrup: In November crop appeared very good, but went off with red rust, takeall, and hay-die; Late Gluyas on fallow, 15bush., good heavy grain, sown at the rate of 1bush. of seed and 75lb. super per acre; little takeall where drift had blown over from adjoining field; wheat after oats showed very little takeall, but some red rust, 12bush.; Golden Drop and Canberra badly affected with rust; 30 bags off 70 acres—best grain on red soil. Mr. F. Kammermann: 10 acres Nabawa after barley grass had sheep on, and burnt, combined, 15bush.; Nabawa combined on stubble, 11bush.; Faun, 15bush., badly rusted; Wogga on ploughed land, 10bush.; Early Burt oats sown without super grew heavy crop of hay, cut very green, stock ate readily, and no trouble with mice. Mr. D. Ingram: Nabawa on new land, 15bush.; no rust, but some frosted; Gluyas eaten by kangaroos, 9bush. Mr. W. Heath: Best wheats Nabawa and Ford, 9bush. average for whole farm; Caliph badly rusted. Mr. Edmonds: Gluyas 16bush., Canberra badly affected with flag-smut. Gluyas sown on land that had grown eight consecutive crops, was affected with flag-smut and fed off with sheep, yielded 16bush. (Secretary, A. Day.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Wallala	12/4/33	11	Paper from *Journal*	C. Zippell
Mudamuckla	6/4/33	7	Formal	A. Maguire
Maltee	4/5/33	14	Address—W. H. Brownrigg	E. Schwarz
Yaninee	9/5/33	23	Discussion	J. Boehm
Laura Bay	9/5/33	14	Discussion	W. Edson, Ceduna
Wudinna	5/5/33	8	Discussion	D. Duguid

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

KANNI.

March 11th.—Present: 12 members.

Harvest Operations.—Paper read by Mr. L. Schulze:—''In preparing for the work to be done during harvest, care should be taken that all machinery has been carefully overhauled and all weak and worn parts replaced. Many farmers forget the care of their horses. Their hoofs should be carefully trimmed during September or October, for in the hot, dry weather the hoofs become dry and brittle, and are liable to crack and break. The horses' tails and mains should be trimmed during July, giving the hair time to grow again for summer, when flies are troublesome. After working the fallow the farmer should try and give the horses a fortnight's spell in order to have them in good heart for harvest, when work is heavy and strenuous. For the average mallee farm the machinery should consist of two 8ft. strippers and power winnower, and motor truck to do the carting. Cornsacks should be spread out in the sun to stretch, or dipped in water and hung out to dry. I favor emptying the wheat on a sheet, this can be made by stitching the wrapping from the bags together. The strippers should work so that one machine will be half way round the paddock when the other is emptying at the winnower, this not only avoids loss of time by one waiting for the other to get out of his way, but allows the wheat to be unloaded close up to the winnower. One man at the winnower should be able to keep two strippers going. Stitching can be done on mornings when it is too damp for stripping. Get the wheat to market as early as possible after it is cleaned, it looses weight if left standing about in the bags. Cart all cocky chaff, which should be put in shed made for the purpose. When this is full the balance should be covered and stored in the paddock for use in winter, and as a standby in times of drought. After covering all sheds with straw a stack should be made in the paddock, this will provide good shelter for stock. When harvest is completed clean and overhaul all implements, and carefully put them back in the shed ready for next harvest.'' (Secretary, F. Hoad.)

KULKAWIRRA.

April 11th.—Present: 10 members.

Welding and Tempering.—Mr. D. Oakley read the following paper:—''To weld, it is necessary to first prepare the irons by dumping the ends to be joined in order to make them thicker. Next the extreme points must be drawn down to the shape of the edge of a wood chisel, beating them with the edge of the hammer to leave a rough surface. Heat the irons until they reach melting point, being careful not to burn them. Good sharp sand is the best thing to avoid burning. When the iron starts to spit, dip it in the sand; this can be repeated several times, until the iron reaches the desired heat. Do not try to obtain this heat too quickly—an even, steady blast is best. By heating too fast there is a danger of burning the outside before the middle is hot. Tempering is generally done by watching the color of the steel when it is cooling off. The color ranges from a shade of blue to nearly white; the lighter the color the harder the temper; there is a lot of difference in steel—some is of a much harder nature than others. The amateur can only find this out by testing after the metal

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has cooled off by trying them on the side of the anvil. Warm water appears to be more satisfactory than cold; the latter chills the steel and makes it brittle.'' Mr. C. Robin also read a paper, ''Sheep Management.'' (Secretary, H. Elliot.)

RAMCO.

April 11th.—Attendance, 7.

Review of 1932 Harvest.—Mr. J. Boehm reported that 1½ acres of apricots in his orchard harvested 2 tons 1cwt. Although not a big crop, he thought apricots were a payable crop at present prices. Three years ago he planted 1 acre of peaches, which this year returned ¼ ton dry fruit. This crop he also thought a valuable proposition. Like most other growers, his currant crop had a bad setback. The heavy rain a week or two before picking turned most of the fruit mouldy. Of an 8 or 9 ton crop he was able to dry 5 tons. After treatment this weight would be considerably less. Currants, therefore, were not very profitable this year. Although a good crop was showing, the crop harvested was under a ton to the acre of marketable fruit. This year saw the best crop of sultanas he had harvested. He took 8¼ tons off about 6 acres. It was doubtful if sultanas would be profitable because of the carryover from last season. The lexia crop was on the light side this year, due to a heavy frost when the bunches were forming. Off about 1½ acres he dried 1 ton 19cwts. Quite a lot of second-crop fruit was showing, and this was picked and dipped and will give a little over 2 tons—still below the average of most gordo crops. He also harvested from 1 acre of nectarines 1 ton 2cwts. of dried fruit—a fair crop. Nectarines were a much-asked-for fruit, and the returns should be satisfactory.

Handy Hints.—At the meeting held on May 8th members gave details of ''gadgets'' that had been useful in their work. A small model of a double horse swing was tabled. The pull was not on the wood by hooks, but on iron plates around the swing-bar. Planet Jr. cultivator used to sow manure in the furrows made by the buster when furrowing out for irrigating: Take four stars out of an old drill—two on either side—using tines from the drill with the tube to take manure behind the buster. This works with a chain off the wheel of the cultivator. A box is necessary to hold the manure. It will sow four kerosene buckets of manure down one row and up the other. Broadcasting manure in rows of vines: Bolt a thin piece of wood on to the tailboard of the cart in such a way that when closed there is no opening. When the tailboard is lowered there is an opening which becomes wider the lower the tailboard is dropped. As the cart is driven along the row, sweep the manure to the back of the cart and it flows evenly through the opening. The size of the opening can be gauged to sow the quantity required. Transplanting seedlings without disturbing roots: Take eggshells from boiled eggs. Place in a box and fill box and eggs with soil. Plant a seed in each shell, and when transplanting the seedling the shell and the plant can be lifted without disturbing the roots. (Secretary, J. Odgers.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Moorlands	26/4/33	9	" Dairying as a Sideline," J. Jaensch	R. Wilmshurst
Marama	6/3/33	16	Paper from *Journal*	T. Hinkley
Netherton	2/5/33	20	Address—R. L. Griffiths .	C. Wilkin
Overland Corner	10/5/33	19	Address—R. L. Griffiths .	H. Loffler
Yurgo	8/5/33	19	"Cows," G. Tregilgas ..	H. Mackenzie

SOUTH AND HILLS DISTRICT

FRAYVILLE.

April 6th.—Present: 15 members.

Preparing the Seedbed for Wheat.—Mr. S. Wachtel read the following paper:—In preparing a seedbed, the main object is good fallow. Good fallow alone is the only profitable way of securing good results from a seedbed. Long before the fallowing season appears the feed in the paddocks to be fallowed should be kept as short as possible. A good burn is necessary, especially where an abundance of barley grass is present. The most important operation in preparing a seedbed is ploughing. Some farmers may prefer mulch fallowing—fallow prepared with a scarifier or cultivator; but experience in this district has shown the mouldboard stump-jump plough to be the best implement. If ploughing is not done properly one cannot expect a cultivator or harrows to prepare a clean, even bed. Therefore, keep the plough down as much as possible. As ploughing approaches completion, watch the fallow, and should a dry spell set in and the first fallow show up green, work it with the harrows to control weed growth. If fallowing is done to a depth of 3in. to 3½in. or 4in., in good, clean soil, what is to be gained by ploughing 4in. deep and working the soil 3in.? The first cultivation after ploughing is a very important operation, and one which has caused many farmers a good deal of trouble. A harrowing is necessary in some paddocks, especially those consisting of clay or soils not inclined to drift. It separates the soils and packs the crust, and gives the fallow a fine surface. When cultivating the fallow the first time, work to the bottom; it is useless tickling the crust and leaving the underlayers undisturbed. Since we practised deep working before haymaking, the crops and fallows have improved considerably, and have been much easier to work during later periods. Should the fallow have too shallow a mulch, work it over again after a rain. After the fallow has had a good stirring, before or soon after shearing, allow shorn sheep to have a free run on all fallow. A farmer without sheep is greatly handicapped; sheep are a necessity, they help to bed the fallow and keep weeds checked. On the average of seasons two cultivations are all that is required until harvest time. The fallow should not be allowed to remain unworked over the summer months. Good fallow should remain open-furrowed over the summer, so that the sun and summer rains—which are the main factors in forming plant food—will penetrate more easily. The land should not be harrowed or closed in before the end of January or the middle of February. A good set of scarifier harrows, well set, are one of the finest implements to use after summer rains, especially on small weeds and for cutting a crust on fallow. However, on clay or fallow drifted smooth, they are practically useless, and another cultivation may be necessary; if so, work lightly, and do not in any case work too deeply, because of the danger of spoiling that good seedbed, and tearing up the soil before seeding will do more harm than good. If the fallow must be worked because of weeds, see that this is done at a shallow depth and when the soil is moist. Should early rains fall, keep weeds checked, and if a paddock is badly infested with wild oats or mustard, do not disturb it with a cultivator, but keep at it with scarifier harrows. Should the season break and it is too early to go on seeding, work those paddocks lightly that it is intended to crop last. At all times work the fallows first into which it is most difficult to conserve moisture. To prepare a seedbed for soil that has been fresh ploughed or winter ploughed, I suggest ploughing and seeding soon after, in the winter. A ploughing in January or a later summer month should not be undertaken unless the paddock is free from old fodder or a good burn is secured. Preparing stubble for a seedbed for wheat cannot be recommended, but if undertaken, do not plough it but use a scarifier or cultivator after a burn at the first rain and seed later. Keep all fallows and land prepared as a seedbed free from stumps or an overcovering of stones. Do not forget that fallowing gives a great opportunity for the control of noxious weeds. To summarise:—1. Fallow as soon as possible and at all times fallow the paddock first into which it is the hardest to conserve moisture. 2. When working fallow before spring, on the occasion of the first cultivation, work to the bottom and never work the fallow ash dry. 3. Keep the implements in good order, the tines should be carefully set and adjusted. 4. Never allow weeds to take the upper hand, and when preparing a seedbed work from the bottom up—not from the surface down. At each working reduce the depth. (Secretary, N. Eichler.)

HINDMARSH ISLAND.

Daylight Saving.—Mr. H. Newell (Hon. Secretary) read the following paper:—"It does not seem likely that daylight saving will receive very serious consideration by the general public. So far as Bureau meetings are concerned, there will not be many members who will attend after finishing the day's work, particularly dairying, pigs, poultry, gardening, harvesting, &c., and it is quite probable that many Branches of the Agricultural Bureau would close, and other organisations receive very little support. Adelaide is about 60 miles away from this district, and folk from here like to go to the city on a Saturday to do some shopping and attend to other business. With daylight saving this would not be possible, because after the children got ready, and livestock, &c., attended to, the city would be reached when business houses had closed. School children can do much of a morning to help in the home, except those who have long distances to go to reach the school; but this could not be done under daylight saving. Gardens would perish, because morning work is so useful, and an afternoon is not suitable until towards sundown, unless cloudy weather prevails. Folk who lived at any distance from the route of the early service cars would not be able to get to the city to transact business. Country people would not be able to attend functions at neighboring towns, because rural workers mostly finish work with the daylight, and in summer this would be even more noticeable.''

INMAN VALLEY (Average annual rainfall, 26in. to 27in.).

April 20th.—Attendance, 20.

Economy on the Farm.—Mr. J. Muller (Myponga) read the following paper:—''Not all farms are situated alike, and it is impossible to lay down any hard and fast rules whereby economy can be practised, and evidence is not lacking of the waste that occurs on some farms. One of the most frequent examples of the latter is in the lay-out of the farm. The beginner should so lay out the farm that it is as convenient as possible, because once the farm is laid out, the house built, the fences put up, and the sheds, &c., built, they invariably remain so, and very often are the means of wasting a considerable amount of time. One often notices that the homestead has been built at one end of the holding when it could just as easily—and possibly more conveniently—have been erected near the centre, thereby saving much labor in going to and returning from work, especially on a dairy farm, where it is necessary to take the cattle out to the paddocks and bring them in to be milked. In this case a race to the paddocks is a great saving of labor; however, this is not possible on every farm, and the division, &c., must be left to the individual. Another point to be stressed is to have the holding cut up into a fair number of paddocks, and change stock about frequently. It has been proved that by so doing the carrying capacity is improved in some cases up to 50 per cent. Another source of economy is good fences. Where sheep are kept seven wires are more economical than six. If 'Cyclone' is used, a plain wire about 3in. above the 'Cyclone' prevents cattle pressing down the fence. Poor fences are a source of danger and false economy. When cattle and sheep are hand fed it is more profitable to build portable racks than to throw the hay, &c., out on to the ground. It is economical to hand feed both sheep and cattle—even dry and young stock—during that part of the season when feed is short. It has been proved definitely that the break in the wool is caused through shortage of feed, and every sheep farmer knows what that means to his wool cheque. There is no reason why this should happen, since the advent of top dressing and improved pastures has meant that there is an abundance of feed during spring which could be cut and stored for the leaner parts of the year. Too often paddocks of valuable feed are allowed to dry off, and eventually rot on the ground and become a source of danger to stock. No farmer can ignore this fact, nor allow such an uneconomical state of affairs to exist. Another common source of waste is the injudicious feeding of stock and the soil. An unbalanced ration is wasteful. More often than not an animal is turned out into a paddock of unpalatable and innutritious feed and expected to give a good return for it; the very same farmer would no doubt complain that he could not afford to feed properly. The balanced ration, both for stock and soil, is the most economical, and it behoves every farmer to study the requirements of both. If this is done the farmer will not only find it profitable, but interesting, which will make his work a pleasure. A common source of waste is to be just a little bit behind with one's work. The most successful man is the one that is waiting for his work, not the work waiting for him. A farmer to get the best out of his time and money must have a place for everything, and keep everything in its place. Of late years, when all kinds of stock have been bringing good prices, many farmers have been keeping and breeding animals of a more or less nondescript nature, but the time has gone when it is possible to make farming pay with that class of stock. The best has never been too good, and under present conditions, when one can only just keep afloat with the best stock under the best conditions, it will at once be seen that the man working with poor or indifferent cattle will be the one to pass out. Once we have better stock the desire to feed and tend to them better will come naturally, and every farmer that studies his stock will not be content to stop at that, but will eventually improve the whole of his farm, and one by one the little slacknesses will disappear and a desire to have the whole farm more ship-shape will take its place. Most farmers are conversant with such things as looking after implements, keeping machinery screwed up tight, straining up fences, having gates to openings, &c., indeed when one comes to look around it seems the opportunities to economise on the farm seem to be never ending. A saving of 6d. per day means £7 16s. per year, and this makes one wonder how much can really be saved on an average farm during the year. One thing is certain, that although many farmers know how to farm very few know how to economise without losing efficiency, in which case it would cease to be economy.'' Discussing the paper, one member said that five plain wires and one barb should be a good fence, and any stock that would not stay within it should be fattened and sold. In feeding clover hay in racks it was found that sheep were likely to get seeds in eyes; feeding loose on the ground was found to be satisfactory, but in wet weather racks would have to be used to avoid waste. Bone meal (sterilised) and salt, equal parts, had been used for licks locally, and found to be very beneficial to both sheep and cows. Referring to land becoming ''clover sick,'' Mr. Muller had had no signs of this on his property. Starting 25 years ago with 1lb. of clover seed to experiment with and using supers rich in lime, he had worked his property into a creditable holding. Four and a half acres of his property had carried seven cows and one yearling for 11 weeks prior to cutting, and then yielded 4 tons of hay per acre. Horse beans—with no special preparations—were planted at 1bush. per acre on 1½ acres and yielded 20 3bush. bags. They were a very good feed for pigs, sheep and cows, and could be profitably grown more extensively. *Phalaris tuberosa* planted on soil of a sandy nature could be encouraged to root deeply to carry stock through the dry period by the application of sulphate of ammonia. The grasses which appeared to do very well and provide useful feed at various periods, and not hard to establish, were Perennial Rye, *Phalaris tuberosa*, Cocksfoot, and Clover. All were good ''doers'' in this locality, and could be made to produce better growth by the application of lime phosphates. (Secretary, H. Lewis.)

MILANG (Average annual rainfall, 14.92in.).

April 8th.—Present: 17 members.

The meeting took the form of a question box. Mr. Casley asked the best period to sow Mulga oats. *Ans.*: It was thought that owing to the prolific nature of their growth, it would be advisable to sow about the last week of May and with safety in the second week in June. Mr. Turney asked a cure for sand in horses.

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The following were advised: (1) Dose with soda and black coffee if the animal is bad; and if the attack is only slight, feed pollard in chaff. (2) Give a drench of new milk and honey, or an enema of half a bottle of kerosene and soap and water, using a rubber tube and funnel. Back rake when necessary. Mr. J. Pearce asked cure for lung worms in sheep. *Ans.*: Dose with a 10 per cent. solution of bluestone, giving about a small olive oil bottle full to a full-grown sheep, and half the amount to lambs. When dosing, do not sit the sheep down; let the animal drink slowly, so that the dose will not get into the windpipe. Always dose on an empty stomach, and if worms are inclined to be bad, repeat dosing every month until three or four doses have been given. Dose lambs after weaning. Mr. Landseer sought informaton as to the best methods to combat take-all. *Ans.*: It was thought that take-all could be caused by dry working, insufficient drainage, and very wet seasonable conditions. The spores were most active during April, and if an extra working could be given then, it might minimise the disease considerably. Sowing oats was mentioned as an excellent alternative. Mr. H. Warner asked which is the best paying proposition, ewes and lambs or wethers. *Ans.*: The responder thought that the former was outstanding, because there were the lambs and wool. He recommended a Border-Leicester x Merino for fat lamb raising. (Secretary, L. Yelland.)

DAIRYING IN DENMARK.

(*A paper read by Mr. B. Kronmark at a recent meeting of the Myponga Branch.*)

The Kingdom of Denmark, though one of the smallest countries in Europe, plays a large and important part in world economy by virtue of its geographical situation and highly developed trade. Unlike England, France, and Poland, it has no coal, nor does it possess the huge resources of water power of countries like Norway, Switzerland, and Austria, much less oilfields like those of North America and Roumania. The power resources in this country represented by peat, wood for fuel, water and wind, normally furnish barely more than about 3 per cent. of its requirements, and with respect to minerals, the country is equally poor.

Notwithstanding Denmark being in a marked degree devoid of natural sources of wealth in the way of minerals, the Danish people have proved themselves capable of making up for this handicap by evolving a scientifically carried out process applied to agricultural products. A trade has been developed which—in proportion to the size of the country and its population—is second only to that of one or two other European countries. The population is 3½ millions. About 67 per cent. of the people are actively engaged in agriculture, which is carried on by a very large number of independent concerns, comprising about 2,100 large estates (over 100 acres), 88,000 farms (20 to 100 acres), 125,000 small holdings (less than 20 acres). About 75 per cent. of the total land areas is under cultivation, and some 85 per cent. is covered with forests and plantations.

It is generally considered that the country is eminently suited for dairying, but this is not so. The country is too flat. The soil in many counties is poor, hungry, and sour, and only by years of heavy consistent toil by the owners have large areas of land been brought on production basis. Further, the summer and winter climates show extremes of temperature which add to the dairy farmers' many burdens.

Up to 1875 farmers depended upon the sale of grain and fat cattle for a living. The advent of the United States of America and Russia on the world's market with cheap grain definitely pushed out the Danes. In looking around for other sources of revenue a start was made in dairying, depending on England and Germany for the exports. Butter was made on the smaller farms and bought by merchants, who packed it in casks without proper grading and supervision. The quality was poor, and the prices realised still poorer.

In 1878 the continuous centrifuge was invented. This made it possible to separate efficiently large quantities of milk in record time, thus giving the farmers the opportunity they so badly wanted, and in 1882 the first co-operative butter factory was opened. The milk from 300 cows was subscribed. The Government of the day realised the possibilities ahead of the small farmer in this system of marketing his output, and sent dairy experts lecturing to the farmers regarding the advantages. It was readily observed that it would be possible to produce more and better butter, and the small cowkeeper would get the same price as the large farms or estates. Manufacturing charges would be smaller. Farmers would get cash at regular intervals instead of selling to the store and having to take groceries as payment; fewer journeys to the market, which meant saving time and money, which consequently meant larger herds and better feeding.

The plan was so greatly supported that by 1887 no less than 900 co-operative butter factories were operating in Denmark. Many difficulties were encountered and had to be overcome. Capital had to be found even though those factories were erected and run very economically. The building and plant of the first co-operative factory cost £300.

Technical difficulties cropped up. The separated milk returned from the factory, and used for human consumption as well as pigs and calves, spread tuberculosis. It was considered detrimental for stock feeding and threatened to stop the development of the co-operative factories.

Fortunately, the discoveries of the great French scientist, Pasteur, were by 1882 brought to commercial possibilities. He found that fermentation was due to bacterial growth. By boiling milk it was possible to check or kill the growth of microbes, and greatly improve the keeping quality. This system was promptly adopted. In 1898 it was made law that skim milk and cream must be pasteurized.

The butter factories grew in numbers and it was found that the markets abroad were able to absorb the output. Herds were increased, proper feeding was given more attention, intensive cultivaton of the land was advocated, and sidelines, such as pigs and fowls, were found to be profitable until these were considered a necessary adjunct

1933 CALENDAR 1933

JANUARY

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FEBRUARY

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APRIL

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OCTOBER

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1934 CALENDAR 1934

JANUARY

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FEBRUARY

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MARCH

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APRIL

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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● FULL MOON.

of the dairy farm. These sidelines were also developed along co-operative lines, and every effort was made to obtain for the producers the full benefit of his labor by cutting out the profit of the middleman.

In 1927 there were 1,362 co-operative butter factories, with an average of 143 suppliers. There was an average of 990 cows supplying each factory. The average annual milk yield per cow was slightly above 6,000lbs. and barely 280lbs. butterfat.

The aim of the Danish farmer is to keep the largest number of efficient cows as possible on a given area—a cow on two acres or less. Concentrates are used very extensively; oil cakes, mostly copra and cotton seed, are imported. It has been estimated that for every £5 the farmer received, he paid to foreign countries £2 for cattle food.

Artificial manure is used to some extent, but on account of the cattle being housed six to eight months of the year, the cow manure is made use of to its fullest extent. Careful methods of husbanding the solids in covered concrete pits, and the liquids in cisterns, are resorted to. This is applied in small quantities at regular intervals, and the producing power of the land is increasing from year to year.

Since the year 1880 the harvest yield in Denmark has doubled, and during the same period the number of head of horned cattle has likewise doubled. There are now ten times as many pigs and six times as much poultry as in 1880. It may safely be estimated that about 90 per cent. of the crops of grain, grass, and roots serves as fodder for the livestock. The remaining 10 per cent. covers the cultivation of sugar beet and the important export articles, seeds, and malting barley.

The breed of cattle mostly favored in Denmark is the Danish Red, also Holstein Friesian, and to a lesser degree the Jersey.

The great development of the breeds has been due to the farmers' skill, intelligence, and common sense in selecting and breeding for milk production alone. Only the best heifers are raised, and with the record of the dam and the qualities of the sire known, their selection is comparatively simple. The co-operative cow testing associations—begun in 1895—have proved so helpful in weeding out unprofitable cows that they have rapidly increased to more than 500 associations. A man is employed by each association to visit the farms and do the testing at least every three weeks. He weighs the milk, keeps accurate records of the feed consumed, so that the net profit of the year of each individual cow can be ascertained. These associations are purely co-operative and do not enjoy Government subsidy.

Cows are generally treated with kindness, and every effort is made to have them comfortable in winter and summer. Cowsheds are built of brick or stone, with proper drainage for liquid manure. Ventilation is always given attention. Water is often laid on for drinking and sanitary purposes. On many farms cows are regularly groomed. Cows are seldom pastured, but tethered by means of a halter on the head and a rope or chain 12ft. to 20ft. long, which is attached to a 10in. pin of wood or iron, driven into the ground. The cows are moved generally five times a day, from 3ft. to 6ft., depending on the amount of feed. This is the Danish farmer's chief point of economy in summer feed. Many small dairymen take the cows to the stables to be milked three times a day; on the large farms the cows are often milked in the fields. They are stabled all winter, fed all the straw they will eat, and on an average 4lbs. hay, 40lbs. to 100lbs. of roots (mangels or turnips), and about 6lbs. of concentrates per day. These consist of oilcake, bran, barley, and oats. An even flow of milk is required the year round, and most cows freshen from September to May—that is in winter. Many farmers insist on dry milking.

Everywhere cowsheds are white washed at frequent intervals and kept sanitary and clean. The milkers have clean overalls, udders and flanks of the cows are brushed, teats washed and dried before milk is drawn. Aluminium pails and transport cans are favored because they are easily cleaned, rustproof, and never taint the milk. Hand-separators are unknown in Denmark. The milk is sent to the factory daily and skim and buttermilk returned according to the farmer's requirements.

Milk-collecting routes seldom extend above 5-6 miles, because factories are in every village and farms are so small. Milking machines are not in favor.

Pigs are produced on every farm, and besides using the skim milk on a very careful feeding plan, huge quantities of grain are imported for this purpose. The breed is native and the weight of pigs demanded by bacon factories is 140lbs. The bacon is exported to England green, and is smoked as required. There are 48 co-operative bacon factories and a small number of private proprietary factories. In 1927 5,098,206 pigs were killed. Denmark supplies the world's market with more than one-half of the total bacon supplies.

As regards egg exports, there are seven co-operative bacon factories that collected and shipped eggs. Of the total production, 24.9 per cent. was exported to England principally through Danish Co-operative Egg Export. Denmark provides 12 per cent. of the world's egg supplies.

In 1927 there were nine co-operative cattle export societies, with 15,548 members and a turnover of £550,000.

For the purposes of comparison it may be stated that the export values of the most important Danish agricultural products in the years 1913 and 1931 were as follows:—

	1913. Million £.	1931. Million £.
Butter and cheese	10	19
Bacon, meat and other slaughter-house products	9¼	32
Eggs	1½	3¾
Lard, condensed milk, and other foodstuffs . ..	½	2
Seeds for sowing	¼	½

The magnitude of dairying in Denmark and the success of the industry is attributed to a number of factors. In the main, production and sale of produce are mainly based upon a co-operative arrangement, and the joint purchasing societies likewise play a prominent part in this respect. Connected with this principal industry, there is a large number of research institutions, laboratories, controlling bodies, &c., undertaking scientific experiments for the improvement of the soil, new methods of cultivation, control of seed, investigation of plant diseases, milk yielding, &c., and in addition there is also a large number of special technical schools. Co-operation has wrought miracles amongst the Danes, and to this, and this alone, the present sound position of the country belongs.

The Dane is a born small holder and he is by instinct a man of the land. He is a teamworker and plodder. He accepts guidance readily, is trusting, and he works methodically and systematically. He is loyal to every law that co-operation demands for success. He has made buttermaking pay, cheesemaking pay, poultry pay, and pigs provide a rich harvest for the country. Not one important step in dairying has been overlooked by the practical and intellectual men who guide the destinies of the Danish dairy farmer. In that country one observes the practice of dairy science, woven with economical and commercial practices of agriculture.

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Blackheath	13/4/33	5	Paper from *Journal*	E. Paech
Blackheath	11/5/33	8	Paper from *Journal*	E. Paech
Hope Forest ...	1/5/33	15	Paper from *Journal*	E. Muldoon
Cherry Gardens.	6/5/33	14	Homestead Meeting	A. Stone
Balhannah	7/4/33	27	Address—C. Anderson ..	C. Grasby
Balhannah	12/5/33	8	"Potatoes," C. Pitt	C. Grasby
Jervois	14/3/33	25	Address—Dr. Davies	T. Baily
Jervois	4/5/33	28	Addresses—J. Johnson and P. J. Baily	T. Baily
Port Elliot	20/5/33	13	Demonstration—B. Paech	J. Colebatch, Victor Harbor
Shoal Bay	8/5/33	29	Address—A. Cashmore ..	E. Bell
Longwood	6/5/33	14	Annual Meeting	H. Haines
Scott's Bottom	8/4/33	7	Formal	E. Atkinson
Scott's Bottom	6/5/33	8	Discussion	E. Atkinson
Macclesfield ...	18/5/33	14	"Fencing," Mr. Fry	H. Ross
Tweedvale	20/4/33	25	"Mammitis," E. Miller ..	B. Schapel

CROWN LANDS.

LIST OF LANDS OPEN.

The attention of intending applicants for land is directed to the Official List of Lands Open, which is published half-yearly (in January and July). The list shows the areas, localities, prices, short general descriptions, &c., of the sections available, and the conditions under which they may be applied for.

Copies of the list may be obtained on application to the Director of Lands, Box 293A, Adelaide.

APPLICATIONS FOR LAND.

Intending applicants for any lands which are open for application are reminded that application may be made for the whole or any portion of a block. The Land Board has power to allot portions of a block if considered advisable, and to adjust the purchase-money or rent. If only portion of a block is applied for, deposit of a proportionate amount must be made, and the successful applicant would be required to pay cost of survey of the subdivision.

M. McIntosh, Commissioner of Crown Lands.

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All communications to be addressed:

"The Editor, Journal of Agriculture, Education Building, Adelaide."

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A. P. BLESING,
Minister of Agriculture.

AGRICULTURAL VIEWS AND COMMENTS.

MISCELLANEOUS.

Agricultural Bureau Conferences.

Branches of the Agricultural Bureau have been advised that District Conferences will be held as follows:—

Murray Lands (West), at Karoonda, Thursday, August 3rd. (Secretary, Mr. M. N. Blacket, Wynarka.)

Eyre's Peninsula (East), at Cowell, Thursday, August 10th. (Secretary, Mr. Guy E. Smith, Cowell.)

Southern, at Goolwa, Thursday, August 17th. (Secretary, Mr. D. Jeff Gordon, Currency Creek.)

Hills, at McLaren Flat, Thursday, August 24th. (Secretary, Mr. P. T. Wait.)

Murray Lands (East), at Taplan, Tuesday, September 26th. (Secretary, Mr. P. R. Hodge, Nangari.)

Pinnaroo Line, at Parilla, Thursday, September 28th. (Secretary, Mr. C. S. Foale.)

Eyre's Peninsula (Southern), at Cummins, Wednesday, October 4th. (Secretary, Mr. H. M. Roberts.)

Eyre's Peninsula (Central), at Minnipa, Friday, October 6th. (Secretary, Mr. D. V. Kitto.)

Each Conference will commence at 10.30 a.m.

Pig Breeders' and Raisers' Association.

The Provisional Council of the Pig Breeders' and Raisers' Association notifies that owing to lack of support from breeders and raisers, it is impossible for the council to continue, and that it will go into recess until sufficient support is assured to warrant a resumption of activities.

Duty on Sulphate of Ammonia.

When giving evidence before the Tariff Board on the question of the necessity for the rates of duty on sulphate of ammonia, Mr. H. N. Wicks (Chairman Advisory Board of Agriculture) made special reference to the critical position in which the fruitgrowing industry found itself. Freights and general selling costs had steadily risen, he said, and the necessary expenditure relative to crop production had not diminished commensurate with the reduced sale values.

There was a position, which for want of a better name he called the "crop margin," which was the level reached when sales only met cost of production and nothing more. The financial position of many orchardists had not only been reduced to this point, but had passed below this critical juncture, and, of course, a continuance under these conditions could have only one ultimate end. To increase the acreage under these conditions would be financial suicide if done with the idea of increasing the output to endeavor to make a balance and the "crop margin" factor would only be accentuated. This "crop margin" was at present very high owing to the increased vigilance necessary to produce a clean crop, and to the fact that the buyers while paying less than they had done for many years, insist upon, and rightly so, only the first grade and finest fruit, in spite of the fact that their spending power was reduced to a very low figure. This drove the thoughtful orchardist to the following viewpoint in connection with his business:—

It would cost no more to plough, prune, cultivate and spray and irrigate, and even pick an acre of orchard trees carrying an average of 6bush. than it would to go through the same procedure with an acre the average of which per tree might be only 2bush. Therefore the only apparent hope was to increase the yield per tree and consequently per acre. That this could be done was borne out by the figures quoted below.

Before quoting these figures he explained that they were taken from the progress reports of tests being carried out over four years under the direction of the Department of Agriculture. Mr. G. Quinn (Chief Horticultural Instructor) had selected in certain orchards in four fruit-growing areas in this State blocks of trees in which were situated nine test trees, three of which were to remain unmanured, three to have two applications of sulphate of ammonia, one in May and one in September, and three trees to have one application of 6lbs. in September. The results up to date, which comprised the results of two years of the test, were extremely interesting, and opened up the only promising avenue of fighting the present crisis. For the sake of brevity Mr. Wicks averaged the results of the unmanured trees and those of the manured trees in each district:—

- Clare district, season 1931—
  - Unmanured trees average 139lbs. of fruit per tree.
  - Manured two applications 179lbs. per tree.
  - Manured one application 201½lbs. per tree.
- Clare district, season 1932—
  - Unmanured 66lbs. per tree.
  - Two applications 96lbs. per tree.
  - One application 83lbs. per acre.
- Balhannah district, season 1931—
  - No manure 126lbs. per tree.
  - Two applications 136lbs. per tree.
  - One application 169lbs. per tree.
- Balhannah district, season 1932—
  - No manure 147lbs. per tree.
  - Two applications 198½lbs. per tree.
  - One application 201½lbs. per tree.
- Cherry Gardens district (only one year available—1932)—
  - No manure 180lbs. per tree.
  - Two applications 221½lbs. per tree.
  - One application 282½lbs. per tree.

All the above tests were made on Apples, the varieties being:—*Mixed* at Cherry Gardens, *Cleopatra* at Clare, and *Jonathan* at Balhannah. At Balhannah a test was made under the same conditions on Duchess Pears, with the following result:—

	Lbs. of fruit per tree.
1931—No manure	107
Two applications	102½
One application	166½
1932—No manure	149½
Two applications	136½
One application	154½

Mr. Wicks considered that the above was sufficient to indicate the importance of sulphate of ammonia. The use of this fertiliser had become an integral part of orchard management and was generally recognised as of vital importance, but as he saw it, the position was affected in the following way:—

The present duty meant somewhere about £1 per ton added cost to the fruitgrower. If this were deleted and sulphate of ammonia could be bought for £1 per ton less than at the present moment, two things would happen. Firstly, that £1 would be spent on extra manure, which would mean that a greater area would be covered each season. He stated this with confidence, knowing that responsible growers set aside an amount of money for manures every year, and that amount would be spent. If it bought more ammonia the gardens would be dressed with that extra amount. Secondly, when it was considered what a 6lbs. per tree dressing would do, as borne out by the above figures, it did not need much reckoning to show that the extra £1 invested would produce an increase of no mean order. Even if it only bought 1cwt. of extra manure it would still be a profitable investment. The main point, however, was that it would produce the extra yield with no other increased working expenditure.

Wine Stocks in London and Exports.

The Wine Overseas Marketing Board reports that the bonded stocks of Australian Wine at the end of each of the months of February, March and April at 1,900,000galls., 2,256,000galls., and 2,295,000galls. respectively and clearances from bond for the same months were 185,000galls, 219,000galls. and 227,000galls.

The quantity of wine for which permits have been issued for export during February, March, April, and May 1933, amounted to 365,041½galls., 343,523½galls., 215,954½galls., and 222,719½ galls. The details are set out below :—

Destination.	Subject to Bounty.				Non-Bounty.			
	Feb.	March.	April.	May.	Feb.	March.	April.	May.
	galls.	galls.	galls.	galls.	galls.	galls.	galls.	galls.
Great Britain .	290,498	269,038½	200,558½	187,127½	72,326	69,734	5,288	31,502
Canada	950	2,500	9,410	3,100	—	500	80	180
Ceylon	105	—	—	—	130	—	—	—
Malay Archipelago	361	385½	80	97½	332½	169½	125	144½
Pacific Islands.	175	86	50	154	164	776	279	374
India.........	—	50	—	—	—	142	—	—
China	—	60	60	20	—	10	12	—
Africa	—	12	2	18	—	26	10	2
Sweden	—	—	—	—	—	34	—	—
Totals ..	292,089	272,132	210,160½	190,517	72,952½	71,391½	5,794	32,202½

Imperial Fruit Show and Canners' Exhibition.

The schedule of classes and prizes of the Imperial Fruit Show and Canners' Exhibition to be held at Bristol from October 27th to November 4th has been received by the Department of Agriculture, Adelaide. Entry forms and fees must be forwarded to the Department of Commerce, Melbourne, before August 29th or lodged with the Secretary, Imperial Fruit Show Limited, 5, Bloomsbury Square, London W.C. 1, before September 15th. Entries lodged with the Department of Commerce must be accompanied with the fees, including the cost of remitting to London at the current rate of exchange.

The Danger of the Use of Carbon Tetrachloride as an Anthelmintic for Sheep Grazing on Soursobs.

Mr. C. T. McKenna, Government Veterinary Officer, states that during the last month a serious mortality amongst sheep came to the notice of the Stock and Brands Department. The sheep were grazing on soursobs and were in good condition and healthy. The owner thought that there might be some worms present and drenched with carbon tetrachloride. Two days later the drenched sheep started to die, and to date the losses have been 33 per cent. of the flock. The carbon tetrachloride drench was the cause of the mortality.

The reason is that carbon tetrachloride is a dangerous drug to use if there is a deficiency of available lime (calcium) in the blood of the animal, and it is known that when sheep are grazing on soursobs the oxalic acid salt in this plant does cause such a deficiency.

The use of carbon tetrachloride as an anthelmintic for sheep grazing on soursobs is therefore not recommended.

However, the copper sulphate drench can be used with safety.

ROYAL SHOW.

SPRING 1933

ENTRIES CLOSE

FRUITS (Classes 1725 to 1729) ..	WED. Aug. 2, at 4 p.m.
CATTLE	THUR. Aug. 3, at 4 p.m.
SHEEP	" " "
WOOL	" " "
FAT STOCK	" " "
MODEL GARDENS— (Classes 2360 and 2361)	" " "
HORSES (Heavy, Roadster, & Blood)	" " "
SWINE	" " "
JUDGING COMPETITIONS	" " "
SHEAF-TOSSING	" " "
LOG CHOPPING	" " "
POULTRY	TUES. Aug. 8, at 4 p.m.
PIGEONS	" " "
DOGS	" " "
HORSES-IN-ACTION & TROTTING .	THUR. Aug. 17, at 4 p.m.
FRUIT PACKING COMPETITIONS	FRI. Aug. 18, at 4 p.m.
FRUIT (Classes 1735 to 1765) ..	" " "
VEGETABLES	" " "

Are You a Member?

It pays to be a Member of the Society. There is considerably more in this than the personal gain of being able to visit the Show when you so desire. Your Membership means a personal interest in the activities of the Society, which is endeavoring to improve every phase of primary production of the State.

The subscription is **£1 1s.** per annum, for which a Member is entitled to Tickets of admission to the Show for himself and two ladies to all sections of the grounds, including stand reserved exclusively for Members.

LADIES' TICKETS ARE TRANSFERABLE, AND WILL ADMIT BOYS UNDER 14 YEARS OF AGE.

HAROLD J. FINNIS,
23, Waymouth Street, *Secretary.*
Adelaide.

Fruit Preservation.

"Principles of Fruit Preservation."—This book, under the authorship of T. N. Morris, M.A., of the University of Cambridge and the Department of Scientific and Industrial Research Station, published by Messrs. Chapman & Hall, Limited, of 11, Henrietta Street, London, W.C. 2, is the result of nine years' research and factory experience in fruit preserving and five years' investigations on the problems of fruit-canning. It deals with control of processes in the manufacture of jams, jellies, fruit canning and drying, &c., and contains an especially valuable chapter devoted to the composition of a large number of fruits. The published price of the volume is 15s. net.

Publications Received.

The Library of the Department of Agriculture acknowledges the receipt of the following publications:—

Flock Book Border Leicester Sheep Breeders Association, Scotland, 1933.
*"Home Grown Feeding Stuffs;" 6d. net. Bulletin 13.
*"Fruit and Vegetable Production for Commercial Canning;" 2s. net. Bulletin 45.
*"The Housing of Poultry;" 2s. net. Bulletin 56.
*"Table Poultry Production and Battery Brooding;" 1s. net. Bulletin 64.
*Bulletins published by Ministry of Agriculture, England.

Kent Tells the World, 1933.—A special production by the Association of Men of Kent and Kentish Men under the auspices of the Empire Trade League. Contains many articles—copiously and well illustrated—on Industries and Social Activities of Kent. Printed by the *Kent Messenger*, Maidstone; price (in England), 1s.

VETERINARY INQUIRIES.

[*Replies supplied by Veterinary Officers of the Stock and Brands Department.*]

"C. F. A.," Monarto South, asks remedy for sheep affected by eating stinkwort.

Reply—Stinkwort itself does not poison sheep. It can, however, help in causing an infectious bowel condition (entero-toxaemia) probably by the spikes of the plant damaging the lining of the bowel wall. If losses in sheep running on stinkwort are occurring, it is suggested that: (1) Flock be put in to fresh paddocks and *supplementary feeding with chaff be given*; (2) as soon as the disease is observed, enforced exercise (2-3 miles daily) should be given; (3) all carcases of sheep which have died should be burnt or buried deeply; (4) it has been definitely shown that a flock bred on affected properties develop after a time immunity to the disease. Avoid, therefore, as far as possible the introduction of sheep from areas where the disease does not occur. It should be the aim to breed from the flock on the property.

"E. E. S.," Rendelsham, asks treatment for tapeworms in horses.

Reply—(*a*) Give the following mixture once daily for a week (mix in a small mash and give before morning feed):—Freshly ground areca nut, 4 drams; antimony tartrate, 1 dram. (*b*) At the end of the week starve for 18 hours and then give following drench, well shaken up:—Raw linseed oil, 1½ pints; oil of turpentine, 4 tablespoonfuls.

"B. F. K.," Yorketown, has bull dehorned 15 months ago. One of the wounds refuses to heal.

Reply—Owing to the fact that the condition is of long standing, infection has probably by now spread to the frontal sinus of the head (with which the horn cavity communicates), and it is improbable that the treatment which you can apply will prove effective. All you can do is to swab out the hole in the base of the horn as thoroughly as possible with pledgets of cotton wool soaked in warm weak lysol solution and held in a pair of forceps or bound to one end of a small stick. Then when all discharge has as far as possible been removed by these swabbings, plug the cavity with a piece of gauze or cotton wool soaked in the following preparation:—Creosote, 6 parts; turpentine, 20 parts; olive or raw linseed oil, 40 parts. Repeat treatment (swabbing

and plugging) daily. If this treatment does not prove effective after a reasonable trial, if possible get a qualified private veterinary surgeon to operate on the animal. He would have to open up the sinus, so that it could be thoroughly drained and flushed with antiseptic solutions to destroy the infection and permit ultimate healing to take place.

''E. J. C.,'' Brentwood, reports mare with very swollen shoulder.

Reply—The mare should be spelled from work and the shoulder bathed at frequent intervals with hot water, continuing the treatment until the swelling subsides. If abscess formation results, open with a clean sharp knife to permit of proper drainage of the imprisoned matter or pus and syringe out the abscess cavity daily with weak, warm, lysol solution, followed (after discharge has been cleaned away) by plugging with gauze soaked in tincture iodine, 1 part; water, 3 parts. When the shoulder has healed, harden the skin by bathing daily with a strong solution of wattle bark or salt.

''R. P.,'' Ceduna, reports ewe with swellings under chin and cheek, died after having twin lambs.

Reply—These indicate a debilitated condition of the animal's system, and it is probable that the strain of bearing and suckling twin lambs was largely responsible for this. There may also have been present some infection of the breeding bag, following the lambing. Helpful treatment would have been to have given the ewe doses of 5 grains of powdered nux vomica on the back of tongue three times daily as a tonic, and by drenching with warm gruel, milk, &c., tried to sustain her strength until a natural desire for food returned, when she could have been put on to nourishing diet. Daily douches of the breeding passage with warm Condy's solution (strength ½ teaspoonful crystals to 1 pint water) should also have been given.

''H. J. W.,'' Finniss, reports young pigs with dysentery.

Reply—No information on the feeding or whether the pigs are suckers or weaners is supplied. The following general treatment should be tried:—1. Isolate affected pigs. Give them plenty of grazing. 2. Until diarrhoea stops, put affected pigs on to skim milk and pollard and put in 1 pint of lime-water for every four pigs. 3. Supply the following lick to all your pigs:—Salt, 4lbs.; ground limestone, 8lbs.; dicalcic phosphate, 4lbs.; potassium iodine, ½oz.; iron oxide, 1lb. Feed 2-4lbs. to every 100lbs. of grain (the higher amount is for breeding sows).

''H. W. C.,'' Stansbury, reports mare starving coat and losing condition.

Reply—Starve animal for 24 hours and then give the following drench:—Raw linseed oil, 1½ pints; turpentine, 4 tablespoonfuls. Keep on sloppy diet until the effect of this drench works off. Subsequently feed on damped feed with a daily allowance of green feed if available. One tablespoonful of Fowler's solution of arsenic should be given in the damped feed night and morning for a fortnight; this treatment discontinued for a fortnight and then repeated again.

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AN OUTLINE OF WORK IN PROGRESS, OR CONTEMPLATED, AT ROSEWORTHY AGRICULTURAL COLLEGE, ADDITIONAL TO ACTIVITIES CONNECTED WITH THE TRAINING OF STUDENTS.

[By Allan R. Callaghan, D.Phil., B.Sc. (Oxon.), B.Sc. Agric. (Syd.), Principal, Roseworthy Agricultural College.]

1. The Production of Improved Varieties of Cereals.

The following methods are being used for the production of improved varieties in wheat, barley, and oats:—

(*a*) Selection from already existent varieties which are known to be variable, subject to natural crossing or unstable in any way. Keen judgment and a thorough knowledge of requirements is necessary for this work.

(*b*) The systematic introduction of varieties evolved in other States, or in other parts of the world, and suitable under a similar environment, or which have proved resistant or immune to certain diseases. Varieties so introduced may not be of direct use to us, but some may be used as parents in crossbreeeding, offering new characters, qualities, or disease resistance which may not be possessed by any of our recognised varieties.

This work entails the perusal of literature and agricultural publications from all likely sources, and a study of experimental results with varieties carried out elsewhere.

(*c*) *Crossbreeding.*—This method offers an everlasting source of new types. The mingling of the characters of one parent with the parent of the other, and the re-assortment of these characters in new types in the second and subsequent generations, opens a field of unlimited possibilities. Concisely, the aim of all crossbreeding is to combine desirable physiological characters with desirable morphological characters in the one variety.

The desirable physiological characters are all covered by the two fundamental attributes of yield and quality. Yield is governed by a set of characters which may be grouped under the headings of—(1) Innate prolificacy, or, in other words, hereditary capacity to yield well. (2) Suitability to environment, and in this State drought and soil conditions are important. (3) Disease resistance, under which it is necessary to deal with the rusts, especially stem rust of wheat; the smuts, especially flag smut and bunt; and the root rots, especially take-all.

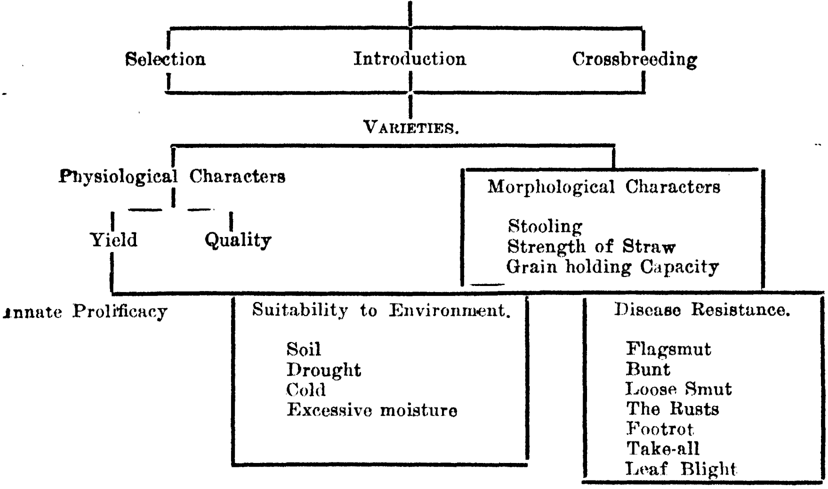
The desirable morphological characters are covered by strength of straw, early habit of growth, tillering (or stooling) characteristics, and grain holding capacity.

The actual manipulation necessary to make a cross is not by any means the most difficult part of the work in crossbreeding. The initial selection of types from the segregating generation requires the keenest judgment and unless the selections are made by a good judge, who is conversant with the requirements of the various parts of the State, much time is wasted and results are dependent upon chance more than skill. Further than that, the subsequent fixation of types and their systematic and scientific trial in comparison with standard sorts, and their tests for disease resistance is undoubtedly work for a fully trained and competent man. In the early years of crossbreeding greater possibilities of improvement existed, the scope was extensive; since then, however, the margin of possible improvement has narrowed in considerably, necessitating greater detail in the work, and especially in trials of new types, where finer differences are to be measured. In other words, the pioneering stage of plant breeding has passed, and work of this nature now requires finer methods in order that finer results may be obtained.

A skeleton of the above remarks is given below and may be accepted as a summarised programme of work being undertaken at the College in connection with the production of improved varieties.

CEREAL BREEDING.

Methods of Improvement.



The Creation of a New Variety by Crossbreeding.

Parent A (Resistant) x Parent B (Susceptible)

The F1 Generation

The F2 or Segregating Generation in which it is safe to assume that every plant in the population has a different heredity constitution. This is the important generation in which all the basic selections are made.

The F3 or families of the third generation.

F4 families, preliminary trial or observation trial.

F5 families, preliminary trial or observation trial.

Fixed lines and systematic trial of any outstanding line against a definite standard variety.

Further trials with the plant breeder for periods up to three years.

Field plot tests.

To the farmer.

2. GENERAL OBJECTIVES IN CEREAL IMPROVEMENT.

(*a*) *Wheat Breeding.*

When the wheat market declined it was evident that farmers temporarily lost much of their interest in wheat, their enthusiasm was thwarted by an unprofitable market. With the parallel decline of all primary products, however, they have found solace in the fact that their fellow primary producers were in like manner clipped of their enthusiasm. Farmers realise, as never before, that every avenue that may possibly increase returns per acre must be exploited to the utmost. They, as well as the State as a whole, must eventually appreciate to the full the unlimited scope for improvement which the hereditary constitution of that group of plants known as wheat offers them per medium of the wheat breeder.

Actually farmers realise that the choice of variety, or varieties, is an important item, and, indeed, to the farmer the greatest criterion of any variety's merit is the net profit it will return in comparison with other varieties. The variety capable of giving the highest net return is obviously the one to seek. This in point of fact, therefore, condenses the problem of wheat breeding into one of breeding varieties capable of increasing the monetary returns of the grower.

Prolificacy in itself does not always fulfil these requirements, for experienced growers know that the inherent capacity to yield well, in other words inherent prolificacy, may be, and is most often, accompanied by defects such as susceptibility to disease, poor quality, weak straw, or a tendency to shatter or shed grain, any one of which may condemn the variety.

Looking further ahead, and basing a prediction on recent reflex actions on wheat and flour quality, the time is coming in Australia, when yield per acre, as such, will not be the only contributory item to the monetary returns of the grower, for he, like the Canadian and American grower, will surely be paid on a quality basis. The present cry, from all those associated with the marketing and utilisation of the wheat crop, is for better quality, and justly so, for it is surprising how soon the depressing influence of varieties such as Nabawa and Free Gallipoli has been reflected in the general quality standard of our Australian f.a.q. samples. The grower, and albeit his adviser, has been accused of perpetrating the slogan "more bushels per acre." The grower, after all, is concerned with bushels per acre while ever he is paid by the bushel and the bushel alone. To give him the necessary incentive to grow better quality wheats, he must be paid more if in getting better quality he is to lose in yield. In this regard total blame cannot be shouldered by State Agricultural Advisers of the Commonwealth, for indeed their slogan is not "more bushels per acre," but "increased monetary returns to the grower," and it must remain so. Actually the incentive to the grower to increase the quality of his produce lies more essentially in the hands of the buyer of that produce. It is admitted, however, that the major problem of quality is one for the wheat breeder, but until quite recently, besides very little incentive being present to produce better quality wheats, there was also no reliable test of quality to guide him in early selectional work. At present the position is different, as besides the distinct possibility of some reward being present to grow high quality wheats in a few years' time, the plant breeder has at his disposal a reasonably reliable test of quality which can be applied to small lots. This, in conjunction with observational and biting tests, will enable almost sure and definite selection being made from the early or segregating generations of cross-bred wheats. Previously material had to reach the fourth, or fifth generation before there was sufficient grain for a baking test.*

The avowed object of the wheat breeding programme at Roseworthy succinctly stated, therefore, is to combine high yield with the attributes of disease resistance, good quality, strong straw, and non-shattering qualities in the one variety or varieties, thereby meeting the demand, which the farmer sets, for high net returns. As the work progresses it is certain that many desirable characters will be combined in the one variety, but to combine all and obtain the perfect variety for the environment in which we live will probably remain an objective for very many years. In all branches of human endeavor the one true and perfect ideal has tantalisingly danced before us since humanity began, and will continue to do so for all time. Striving for this ideal constitutes progress, so, in wheat breeding, let us aim at the perfect type, and it may confidently be expected that great progress will follow. New varieties better and more suitably endowed for South Australia will thus be evolved. The task, although slow, is by no means expensive when the benefits to the State and the grower, which such improvement confers, are taken into consideration.

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* The test referred to above is now rather widely known as the Pelshenke test, and according to information supplied by the N.S.W. Department of Agriculture it has proved reliable but has certain disabilities. Water absorption and diastatic activity are two important attributes which may not be reflected in the Pelshenke figure. It seems that while a reliable gauge of distensibility of a flour is given by the Pelshenke test, the stability of the dough is not taken into account. As the strength of a flour depends upon its stability as well as its distensibility (elasticity) we are now endeavoring to develop a technique for the handling of small samples of grain which will overcome, in some measure at least, the limitations of the Pelshenke test in its present form. In the meantime, however, very reliable selection work from cross-bred material can be carried out by use of the Pelshenke test combined with observational and biting tests.

Whatever success pertains to this programme the policy of the future must be that, even though a variety may be bred which has outstanding economic worth, it must not be released for general cultivation unless its quality is superior to standard varieties such as Nabawa or Free Gallipoli, otherwise our present f.a.q as a marketable commodity will go from bad to worse.

(*b*) *Barley Breeding.*

Here, again, it may be said that the object of breeding is to increase the returns of the grower. In barley, however, the field has not been so extensively exploited by crossbreeding in this country, and this is an incentive to increase activities in this regard. The barleys may be grouped into two major groups—(1) Malting Barley, mainly of the two-row type; (2) Feed Barley, of the six-row type. The chief objective in the first group must be quality; in the second group, yield. A secondary character worthy of consideration is to breed types free from the objectionable barbed awns which make harvesting and handling of the crop an unpleasant task, and reduce the palatability of the grain for stock. Two alternatives are possible, either a hooded (awnless) type with hulled (covered) grain can be sought after, or a smooth-awned hulled type. The latter offers quite hopeful possibilities without interfering with the grain holding capacity of the variety.

Apart from the production of six-row hulled varieties for feed purposes, there is the possibility of producing a suitable type for malting purposes, and the recent demand for Australian grown barley of the Californian Cape type indicates that an export trade with barley of this description may be eventually built up, especially if varieties of the right type and quality can be produced. This opens a very interesting field of work for the breeder, and one which will be pursued with enthusiasm at Roseworthy.

The chief diseases to be contended with in barley are leaf stripe, leaf scald, mildew, smut, and rust. In this State leaf scald and smut are the most prevalent; stripe, mildew, and rust being of little consequence, seldom making their appearance. Varieties resistant to one or more of these diseases are known, and the most practical control can be obtained by breeding suitable agronomic varieties resistant to them.

(*c*) *Oat Breeding.*

Throughout Australia there has been a remarkable increase in the appreciation by farmers of the oat crop, and this increased interest is rapidly growing in this State, largely because the value of the crop in the wheat rotation is becoming better known. Oats commend attention not because of their actual bushel value on the corn market so much as by reason of (*a*) their value as a rotation crop to combat the spread of some of the worst wheat diseases, such as flag smut, take-all, and footrot, to all of which they are immune or very highly resistant; (*b*) their grazing potentialities; (*c*) their usefulness in the conservation of fodder, whether it be as hay, grain, or ensilage. In the wheat areas of New South Wales and parts of Victoria oats are rapidly becoming an integral part of farm practices, simply because they form a desirable, as well as profitable, rotation.

The requirements of the future will be for an oat that will be of reasonably early maturity, produce a large bulk of early green feed, recover well after successive grazings, and yet, if called upon, be capable of yielding high returns of good quality, either for grain or hay. The evolution of such a type is again an ideal, but the nature of certain varieties of oats is so understood as to indicate the feasibility of producing it; in aiming at the ideal new types of greater and wider value will undoubtedly be produced.

Breeding oats resistant to disease is also included in the programme, but, fortunately, the diseases which cause greatest losses in oats, namely, stem rust and crown rust, are not sufficiently prevalent in South Australia to warrant other than secondary consideration. Loose smut of oats is, however, always liable to be troublesome, and definite attempts to breed varieties of oats resistant to this disease are being made. Some of the most useful parental varieties from the point of view of grazing potentiality are, fortunately, resistant to loose smut.

3. PURE SEED PRODUCTION.

The identity and purity of existent varieties can only be maintained by a careful system of selection, comparative testing, multiplication, and handling of pure lines. It is a simple matter for the good farmer to keep a certain variety, or varieties, reasonably pure for a few years, but with the limited time and facilities at his disposal for him to keep varieties pure indefinitely is too expensive, even if he had the time and training to perform the work. Actually, once the seed leaves the stud rows certain agencies come into operation which militate against the maintenance of purity. There is constant chance of mechanical mixture, as well as natural crossing, between adjacent varieties, or between the variety and any rogue plants which may have intruded as a result of mechanical mixture; further, there are factors of general instability within the variety itself.

Undoubtedly this work must be done by a competent, well trained, experienced man in order to get the best and lasting results. In initiating a new scheme for the production of pure seed at the College a definite attempt is being made to frame a progressive programme as "fool-proof" as possible, and granting the initial foundations are correct, pure seed, true to type, true to name, and stable in performance of the various varieties will be maintained.

The following is the programme which has been put into operation this year:—

(*a*) Selected plants from selection rows. The initial selection of several plants, true to type and character, of each important variety.

(*b*) Selection rows, sown from selected plants, producing selected bulk. The grains from the selected plants are sown in rows 30 links long, spaced 4in. apart in the rows. The progeny of each plant is sown in groups of rows adjoining one another for comparative purposes. Any row immediately adjoining the row of another variety is discarded. Only central, or "isolated," rows being accepted for pure seed.

(*c*) Stud rows, sown from selected bulk, producing stud bulk. The progeny from the rows producing selected bulk is sown in long rows 4ft. apart. The rows are about 10 chains in length, sown with a drill and harvested with an especially constructed stripper, which is drawn by one horse and driven by an auxiliary engine.

(*d*) Stud strips, sown from stud bulk, producing pedigree seed. The progeny of the stud rows is then sown in the field between buffer crops of the same variety. The policy at College this year, as far as possible, has been to seed one paddock to the one variety, and the stud bulk strips are sown through the middle of the field. This minimises the risk of mechanical mixture, both in seeding and harvesting operations, and precludes the possibility of natural crossing with adjacent varieties.

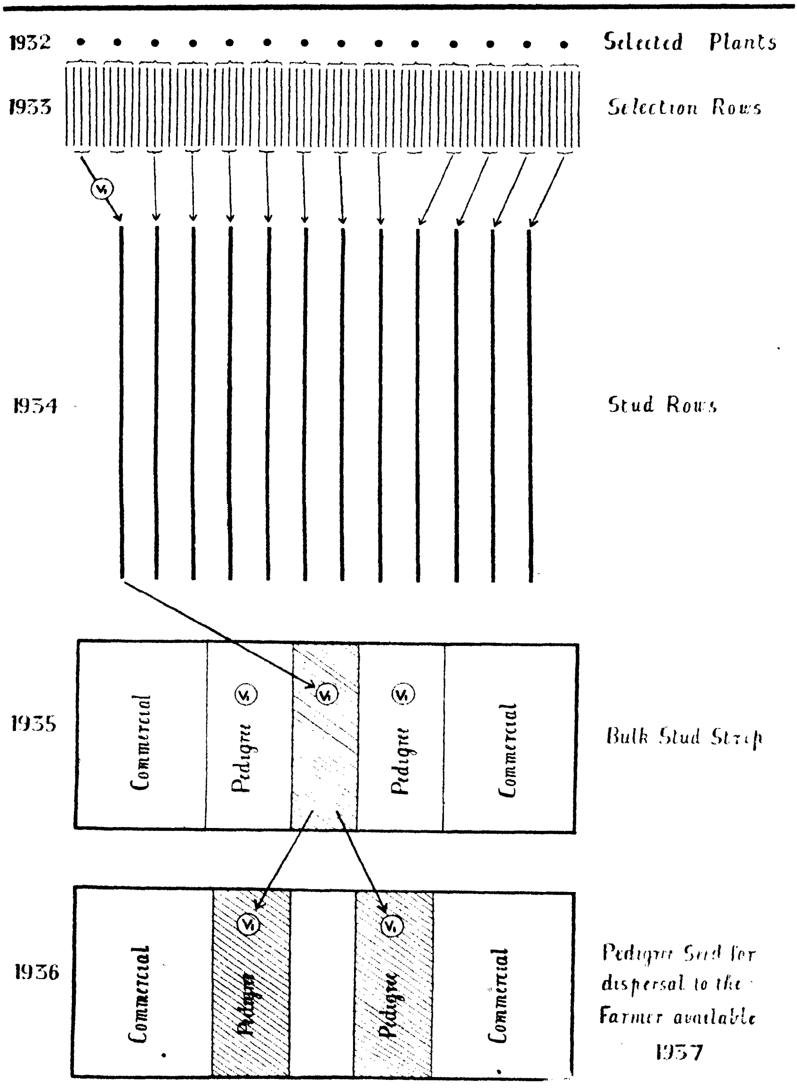
(*e*) Pedigree seed is the progeny of the stud strips, and is used to sow the buffer plots to the next season's stud strips.

(*f*) Pure seed is then sold to the farmer from the progeny of the pedigree seed.

The accompanying diagram depicts graphically the scheme for pure seed production as outlined above.

PURE SEED PRODUCTION

ROSEWORTHY COLLEGE



(*To be continued.*)

PACKING AND HANDLING OF EGGS FOR TRANSPORT.

[In a brochure recently issued by the South Australian Railways Department, Mr. C. F. Anderson (Government Poultry Expert) describes the correct methods that should be adopted by producers to provide for the safe transport of marketable eggs. The main features of the brochure are contained in the accompanying article.]

FOREWORD.

It is indeed gratifying to realise the remarkable growth that egg exports of South Australia have made during recent years, and the part the poultry industry is taking to assist the State during the period of depression. No other branch of primary production has made the expansion that the poultry industry has reached during the last three years, and this illustrates how quickly this particular industry can respond to the call for increased production. It is interesting to learn that for the season 1932 South Australia was the second largest exporting State of eggs in the shell in the Commonwealth, New South Wales being the largest exporter. For the 1932 season South Australia shipped overseas in the form of eggs in the shell a total of 3,934,120doz. eggs. Practically 100 per cent. of eggs exported from South Australia overseas go to Great Britain.

Great Britain has the choice of 32 countries from which to select her supplies of eggs. This shows how important the industry is and how keen the competition must be on the British market. It is, therefore, obvious to everybody concerned how essential it is that only the very highest quality egg be packed at the South Australian end.

The part transport takes in the marketing of eggs from the farm to the packing floor is a very important one, and few people realise the care that is necessary in transport if "rejects" are to be kept down to the minimum.

The Railways, from the point of view of transport, and the Department of Agriculture, from the producing point of view, are working in close collaboration to solve the question of "rejects," in order to ensure the maximum return to the producers and more overseas finance to the State.

PACKING AND HANDLING OF EGGS.

Damage to eggs, whether through fractured air cells, rendering them unsuitable to export, or cracked or broken shells, is an economic waste in an important and expanding South Australian industry. The problem of better packing, careful handling, and safe transportation is one which should engage the attention of every producer, railwayman, and employee associated with that industry. Producers are not expected to protect their eggs against unreasonable transportation shocks, but men handling consignments cannot always prevent cracks, breakages, and fractures if eggs are insufficiently packed, or are forwarded in inferior and unsuitable containers, and rendered liable to damage by the ordinary and inevitable incidents of transportation, whether by road to the railway station or by rail to the merchant.

With a spirit of mutual co-operation, however, the problem can be overcome, if not wholly, at least materially; and the object of this article is to offer suggestions to all concerned in the packing and handling of eggs, which, if adopted, will ensure to the producer more satisfactory returns and greater profits.

Gather the eggs two or three times a day; do not drop them into the basket or receptacle, which should be carried carefully, and not jarred when putting down. Handle the eggs carefully, and do not stand them in the sunlight or in a draught, but always store in a cool dry place. Clean the eggs with care.

GOOD PACKING PAYS.

Other things being equal, the producer who grades, packs, and loads well reduces breakages to a minimum, and the better returns thus realised for the eggs will more than pay for adopting the best methods. Breakages cost money, and because of the fragile nature of the commodity, extra care in packing and handling is essential, and towards this end railwaymen will co-operate.

Having carefully packed the eggs, prepare a mattress 4in. to 6in. thick with straw in hessian or bags and place it on the floor of the conveyance for transportation to the railway station, and see that the cases are firmly tied down or together to eliminate any jars or bumps *en route*.

CONTAINERS.

The *ideal egg case* is one-half to three-quarters of an inch wider than the ordinary kerosene or petrol case, into which fillers fit comfortably, fitted with a removable lid and cleats to facilitate handling, and to hold not more than 21doz. eggs. The shape and weight of this container render it less liable to fall or dislodge in transit. Hoop-iron bands at each end (nailed rigidly at one end) affixed to the cleats are necessary to house the lid, but at the other end the hoop-iron should be movable so as to come over the lid when in position. When the lid is in position it is important that provision be made to drop a loose nail through the movable iron and cleat to prevent the lid working off in transit.

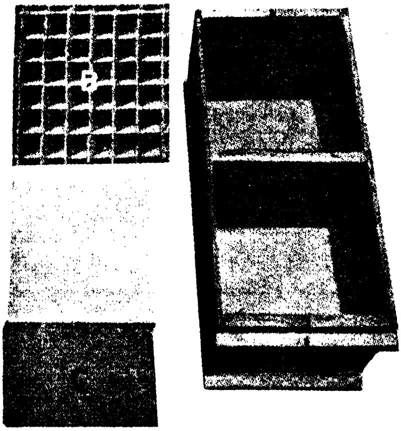


Fig. 1.—A. Export Case. B. Strawboard Filler. C. Strawboard Flat.

"Export" container, with two compartments—resembling double butter boxes—to hold 30doz. eggs in fillers, is an effective and suitable container (*see* Fig. 1).

While it should be the aim of all concerned in the production and handling of eggs to use ultimately only a standard case, and the best standard methods of packing, it is probable that there will be many producers of small quantities who will be content to make use of the kerosene and petrol cases, with and without fillers, &c. All such should see that the cases are in good sound condition, and nailed so that they will not come adrift in handling, also that the cases are clean and odorless.

Finally see that the eggs are firmly packed large end uppermost.

WITH THE EXCEPTION OF THE FOREGOING AND KEROSENE AND PETROL CASES DISCARD ALL OTHER TYPES OF CONTAINERS.

The co-operation of agents and storekeepers who receive comparatively small consignments from farmers and producers is solicited towards the adoption of the standard containers specified herein, and, as far as practicable, to see that eggs are only dispatched by rail in such containers. This may involve repacking, but better results and greater profits will accrue and will ensure notation of unclean and damaged eggs from the farm to the store or depot prior to railing.

IT IS IMPORTANT.

(*a*) To see that all containers are odorless.

(*b*) To nail securely the bottom and sides of containers and reinforce with hoop-iron.

(*c*) To have a cleat of wood at each end of container to facilitate handling *en route.*

(*d*) To affix firmly the address label of consignee.

(*e*) To paint or stencil on each end of container the name of the sender and *his railway station.*

(*f*) To replace all defective boards immediately on return from merchant.

(*g*) To use only containers which can be securely nailed.

(*h*) To use only fine large-headed nails; small-headed nails pull through and split the timber.

(*i*) To use approved fillers with strawboard flats, and to discard fillers with any odor, defective or bent, or more or less softened tips.

(*j*) To use only clean, dry, odorless chaff when fillers are not available, and not sawdust or damp or musty chaff.

(*k*) To place each case of eggs in position without a jar, and not to drop even one end of the case.

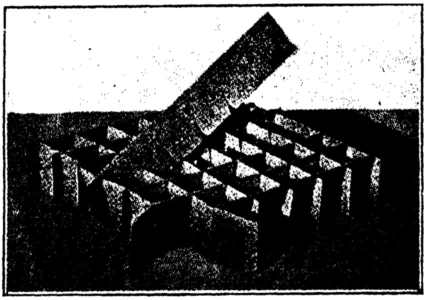


Fig. 2.—Filler of weak construction.

FILLERS.

The increased protection afforded by strictly new, as compared with old or defective, fillers is strikingly noticeable under practical conditions. Too much stress cannot be laid upon the importance of sound fillers and the elimination of any fillers which are distinctly defective. If fillers are not of sufficient strength to support the eggs as they should, any movement of the container results in the collapse of the fillers in the direction of the movement with consequent breakage of eggs. Therefore, do not use fillers of weak construction. Fillers reinforced with a strap on the side to prevent them coming apart and giving longer life to the filler are recognised in the trade as very effective.

When using fillers line the bottom of the container with a woodwool cushion which can be used many times over. Instead of the ordinary strawboard it is found that the "Hold Tite" cup flat, commonly called "Cup Flat" (Fig. 4), furnishes a striking illustration of the effect of good packing upon the safe handling and transportation of a fragile commodity. Eggs packed in "Cup Flats" carry with practically no risk of damage, and the merchant knowing this is frequently willing to pay a premium which more than covers the extra cost of the "Cup Flat." If the "Cup Flat" is not available, use the ordinary strawboard between each filler.

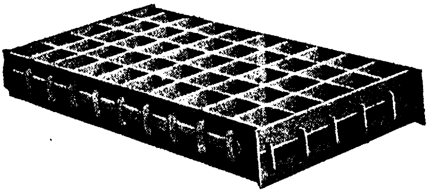


Fig. 3.—An effective filler with reinforced sides.

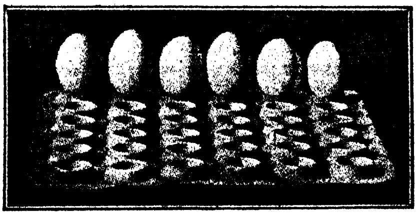


Fig. 4.—"Cup Flat" for use in conjunction with fillers.

All eggs should be packed with the large end upright. Experience has proved that eggs are less likely to have what is termed their air space (which normally is situated just inside the large end of the egg) fractured if the eggs are packed with the large end upright. Federal regulations governing the export of eggs overseas prescribe this method of packing.

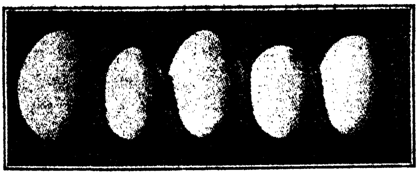


Fig. 5.—Eggs ungraded.

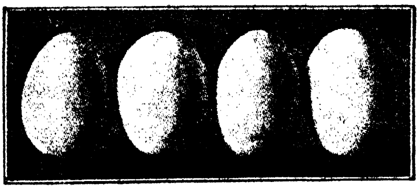


Fig. 6.—Eggs graded.

GRADING OF EGGS.

Carefully graded and well-packed eggs are important factors in consignments reaching the market unblemished and without breakage. No egg should be packed if it stands above the top of the filler, otherwise it will be crushed and cracked in the packing. All such elongated eggs should be sold locally or otherwise disposed of.

A FIRM PACK.

After carefully grading the eggs the first essential is a *firm pack* in strong fillers. When the case is filled a strawboard should be placed over the top layer and the balance of the space between the strawboard and top of the case should be filled with a woodwool or other cushion. It is important to see that the fillers fit snugly in the container, and if necessary to prevent the fillers and eggs rocking about, use packing inside the ends of the cases to prevent undue movement. *If this method of packing be adopted it will not be necessary to use chaff or other substance in the fillers.*

PACKING WITH FILLERS AND CHAFF.

When it is found that fillers have become weakened or damaged through use, and better are not obtainable, it is recommended that chaff be employed with such fillers in packing. The chaff should be clean, odorless, and dry, and a fairly thick layer spread on the bottom of the case. On this place a cardboard flat and then a filler. Place the eggs in the filler, and fill the spaces around the eggs and on top to the level of the filler with chaff and pack the chaff firmly between the sides of the filler and the case. Place another flat on this and repeat until the last layer is in and a cardboard flat on top, when there should still be about one inch of space to the top, and if woodwool packing is not obtainable fill up the remaining space with clean, odorless, *crushed* straw to such extent as to require light pressure to fasten the lid.

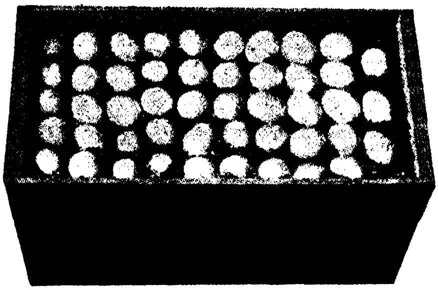


Fig. 7.—Container awaiting last layer of chaff.

PACKING WITH CHAFF ONLY.

Packing eggs in chaff only is more hazardous than using fillers. Spread evenly not less than 4in. of chaff in bottom of case and pad down firmly. After every layer is packed place about 1in. of chaff on top and pad down. After every second layer is packed with the fingers press the chaff down the sides and ends of case to keep the eggs from coming into contact with the wood. When the packing is completed place about 1in. of chaff over the top, pad down, make a firm pack, and affix the lid.

TO THE PRODUCERS.

The Railways Department is vitally interested in the primary production of the State from which it derives large business, and the economical and safe transport of such products is its daily concern.

The expansion and importance of the egg industry have been watched with care, and endeavours made to meet effectively the transportation of this fragile commodity, so fragile as regards the disrupting of the air cell of the egg and thus rendering it unsuitable for export, that it would not be amiss to venture the opinion that some producers do not realise the care needed in successful handling.

With no other motive than a desire to help the egg industry, the following facts might be useful to producers.

Eggs having air cells larger than a sixpence are rejected for export.

Eggs with broken air cells are rejected for export.

With careful and proper packing there should not be any cracks or smashes.

Transport on the railway has been frequently blamed for increased percentage of rejects, and endeavours have been made to find a cause.

On some lines, special vehicles have been set apart for the conveyance of eggs. These vehicles have been equipped with straw mattresses 6in. to 9in. thick on the floor of the truck and at the ends, and dozens of small bags with straw packing used around and between cases, and at each station where consignments are picked up, the whole load is firmly lashed in the truck to prevent movement.

Despite these efforts and reasonable care in handling, odd complaints arise.

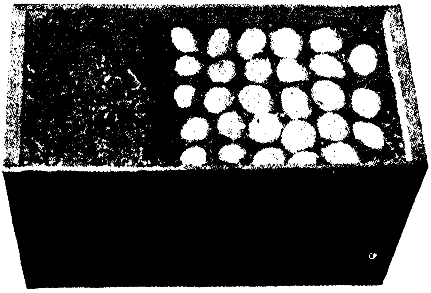


Fig. 8.—Container showing part completed and part with chaff removed.

One producer complained of an 8 per cent. rejection, and blamed the rail transport. An expert and a railway officer went to investigate, and at the farm were shown a basketful of two-day-old eggs, which on being tested showed a 20 per cent. rejection. Next a basketful of eggs gathered that morning was tested and again a 20 per cent. rejection was found. As the producer's young sons gathered the eggs it was thought the fault might be there. So the producer went to the fowl run and returned with two dozen eggs fresh from the nest, and these on being tested showed a 12 per cent. rejection.

This indicates that transportation is not the only cause for rejects.

Every care should be given to feeding and watering, so that an egg suitable for export will be produced.

Packing must be done with intelligent care, using suitable cases and packing.

Handling at the farm and transport to the railway station must be done with needful care.

TOP BRAND

DICALCIC PHOSPHATE

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BONE MEAL

Recommended for Cattle, Sheep & Poultry. Will increase your Farm's Efficiency.

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THE ADELAIDE CHEMICAL & FERTILIZERS CO. LTD.

A REVIEW OF SOME OF THE CRUCIFEROUS WEEDS OCCURRING IN SOUTH AUSTRALIA, WITH PARTICULAR REFERENCE TO THE LOWER NORTH.

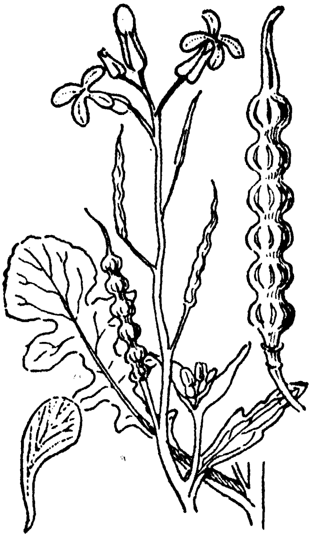
[By WORSLEY C. JOHNSTON, R.D.A., Agricultural Instructor.]

(Continued from page 1259.)

Raphanus Raphanistrum. *Wild Radish.*

(Known also as Jointed Charlock, White Charlock, and Runch.)

Description.—A slightly hairy, tall-growing annual; leaves stalked in the lower ones, not so with those on the stem; they are freely divided, the uppermost segment being the largest; flowering branches branched; flowers white or yellowish with distinct violet lines throughout; pods on spreading stalks ½in. in length, they are ¾-2in. long, very distinctively constricted above each seed, and when ripe breaks up into as many sections as there are constrictions; seed relatively large and reddish in color, resembling Garden Radish. Flowering takes place in the spring.



Raphanus Raphanistrum. (L.)
(Wild Radish.)

Origin.—The plant appears to be of Old World origin and to be established in most temperate countries.

Localities where Found.—In South Australia this plant appears to be widely distributed, but only in very isolated districts does it become very prevalent, and in no area north of Adelaide is it a pest.

Its Agricultural Importance.—In Australia this is a minor weed offering no serious trouble to control. It is mainly a crop weed growing only freely in well aerated soils but never with the same vigor as Wild Turnip. Stock, although not fond of the plant, will keep it in check in stubbles or pasture, but if at all thick is apt to taint meat and milk, so care must be exercised to avoid this difficulty.

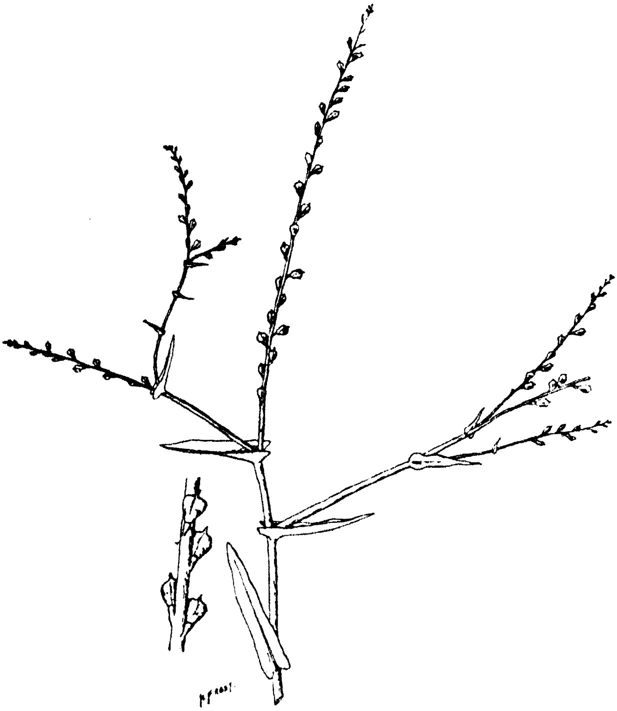
Soils Favored.—There is a decided preference for friable free-working soils rich in plant foods, but it can be found on most types of soil in this State.

Control.—Under most conditions this is not a difficult weed to control; the use of suitable fallow intelligently worked proves sufficient to keep it in check.

Myagrum perfoliatum. *Dog Mustard.*

Description.—An annual with bluish hairless leaves and stems; basal leaves stalked; stem ones clasping; flowering branches much divided; flowers small, yellow; pod closely pressed to the flowering branch, of distinctive shape, about 3/16in. long, with two seedlike swellings on each side of the centre line; seeds, one in each pod. Flowers in spring.

Origin.—The shores of the Mediterranean Ocean.



Myagrum perfoliatum. (L.) (Dog Mustard.)

Localities where Found.—In our State the weed has become established at Kadina, Wudinna, Saddleworth, Brinkworth, Hoyleton, Bute, and Salters Springs.

Its Agricultural Importance.—A bad weed in cultivation, being most serious in cereal crops to be harvested for grain.

The plant competes for available food supplies with the crop sown, but not being endowed with vigorous growth in its early stages it does not produce markedly important results at that time.

The chief difficulty becomes evident when harvest begins, as the plant is about the height of the crop and not readily seen; but as soon as the comb of a machine touches it, the whole plant breaks off at ground level, thus causing a block. This feature of easily breaking at the ground level is particularly marked in this plant, and if at all prevalent in the crop causes much loss of time and grain. The comb of the machine must be opened considerably, but there is not the same compensating results achieved in this case as with Wild Turnip.

The weed ripens its seeds so early that in almost any cereal crop they are ripe before the grain is ready for harvest. This fact makes the purchase of seed from infected districts a very risky procedure. The seed is difficult to grade from a cereal sample, a further feature which should cause great care in the purchase of seed.

In stubbles the plant grows freely, but is by no means relished by any forms of livestock, in fact they can only be brought to feed off it after everything else is devoured and they are literally starving.

It makes very little growth on land which has not been under cultivation for one or two seasons, so that except for its growth on stubble it may be regarded as only a weed of cultivation.

The seed would appear to remain viable for long periods in pasture land, only waiting suitable conditions in which to germinate.

Control.—The control lies in killing the seedlings before they become established. If by any reason this achievement is not attained it becomes increasingly difficult to check the weed.

If established the use of a cultivator with wide shares will be necessary, together with the frequent use of harrows.

Cereals of free-growing habits should be used so as to choke out the seedling weeds, besides which it will facilitate harvesting if the weed is at all prevalent.

Hand cutting in a crop is very difficult, as the plant does not make sufficiently tall growth to be easily seen above the crop. Many plants are, therefore, missed, and cause considerable trouble at the time of harvest.

Great care should be exercised in the selection or purchase of seed from districts where the plant is known to occur, and if such seed is obtained every care should be carried out in grading; besides which the growing crop should be kept under observation to prevent any odd plants maturing seeds.

Soils Favored.—So far as observations have been carried out it would appear that this plant prefers friable, well aerated soils with a fairly high calcium content, although the main feature appears to be adequate aeration. On farms where the plant is known it has not as yet been observed on the popularly termed "Redlands"; this class of soil appears to be too stiff and insufficiently aerated for this weed.

Carrichtera annua. (There does not appear to be any common name applied to this weed.)

Localities where Found.—An annual, hairy plant with a distinctive odor when drying; the leaves are very much divided so as to give them a fern-like appearance; all leaves are stalked; flowers are yellowish with distinct purple veins through the petals; each flowering branch is leafless and does not branch; pods are carried on short stems which curve downwards under the weight of the pod; the pod has a rounded base from which extends a spatula-shaped appendage; seeds are minute, four being in each side of the central partition. The flowering occurs in the winter and very early spring.

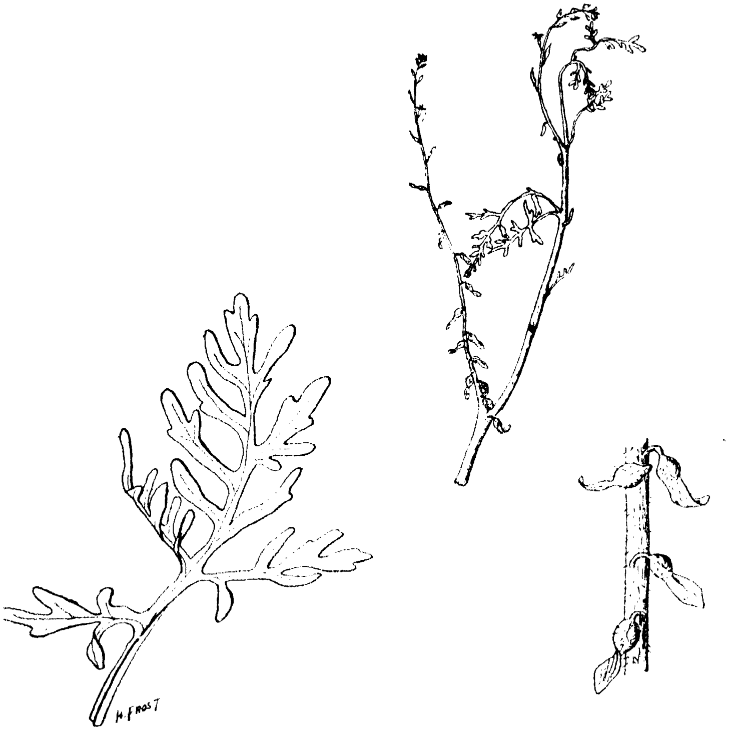
Origin.—The plant appears to be first recorded from Spain, and has extended along the eastern Mediterranean shores.

Distribution.—It occurs in South Australia near Ports Pirie and Broughton, and possibly some places between these points.

Its Agricultural Importance.—The weed is so far only known from districts where very early and sometimes dry seeding is necessary. Under such conditions the weed germinates with the cereal, but it grows with remarkable rapidity and so chokes out the crop.

It is not a deep rooted plant, and because of this feature is quickly affected by the vagaries of the weather, developing seeds at the slightest increase in temperature. It is interesting to note that the plant produces flowers whilst still very small, thus having ripe seeds usually before it has ceased producing flowers. Stock will not feed the plant at any stage of its growth, no doubt because of its hairiness and pungent odor.

There does not appear to be any evidence with regard to its habits and economy in any English literature.



Carrichtera annua. (L.) Prantl.

In situations where the plant has occurred there does not appear to be any evidence of it requiring special conditions for its growth, as at Port Broughton it can be found growing in competition with native plants in virgin scrub conditions. In these localities there is a predominance of light calcareous soils, so that it may be possible that such soils are necessary for its growth.

Control.—By reason of its shallow rooting system the plant would lend itself to control by the use of harrows after the cereal crop has become established. The later sowing of fields in which the plant was known to occur would give a very useful means of combating the pest, but in districts where it is established at present, waiting for rains before commencing seeding is apt to be viewed with little favor.

The practice of summer-fallow would no doubt reduce the plant's population of the soil, and if this were combined with efficient pre-seeding and post-seeding workings the pest should not become very serious. The pre-seeding workings would only be those intended to keep the weed from flowering. It is suggested that seeding be delayed till after rain has fallen and then cultivate the soil as soon as the work can be done. The cereal seed should be sown immediately after this operation has been completed. Harrowing should be withheld until after the cereal has germinated and established its second or third leaf so as to allow any seedling weeds to show up. Then if the work is done with good harrows much of the weed will be destroyed and the cereal will not suffer in any appreciable extent and will quickly make up any check received by the reduction of the subsequent competition. It is felt that a second harrowing can effectively be given at a period of a week or so later. If it is thought necessary extra wheat or cereal seed could be applied at seeding to compensate for the few plants that would be destroyed by harrowing. It is certain that the weed will destroy the crop if not checked so that the use of harrows as described cannot but improve the ultimate yield.

Soils Favored.—It would seem obvious from the limited data available that this plant thrives best on light calcareous soils located within the area affected by the sea's influence. There does not appear to be any marked preference for worked or virgin soil provided it is within the limits described, but it is, of course, realised that sufficient data is not yet available to be definite on such matters.

Neslia paniculata. *Ball Mustard.*

Description.—A hairy annual, reaching 3ft. in height, by no means as robust a grower as many of the weeds reviewed; leaves clasp the stem, having a harsh, rough feel, all clasp the main stem and come to a point; not greatly toothed; flowering stems branched but very thin; flowers bright yellow carried on a long thin stalk; pods small, roundish, wrinkled balls, carried singly on a relatively long stalk; each pod contains a single seed. Flowering occurs in the spring.

Origin.—A Mediterranean plant which has become established in the wheat-growing States of North America.

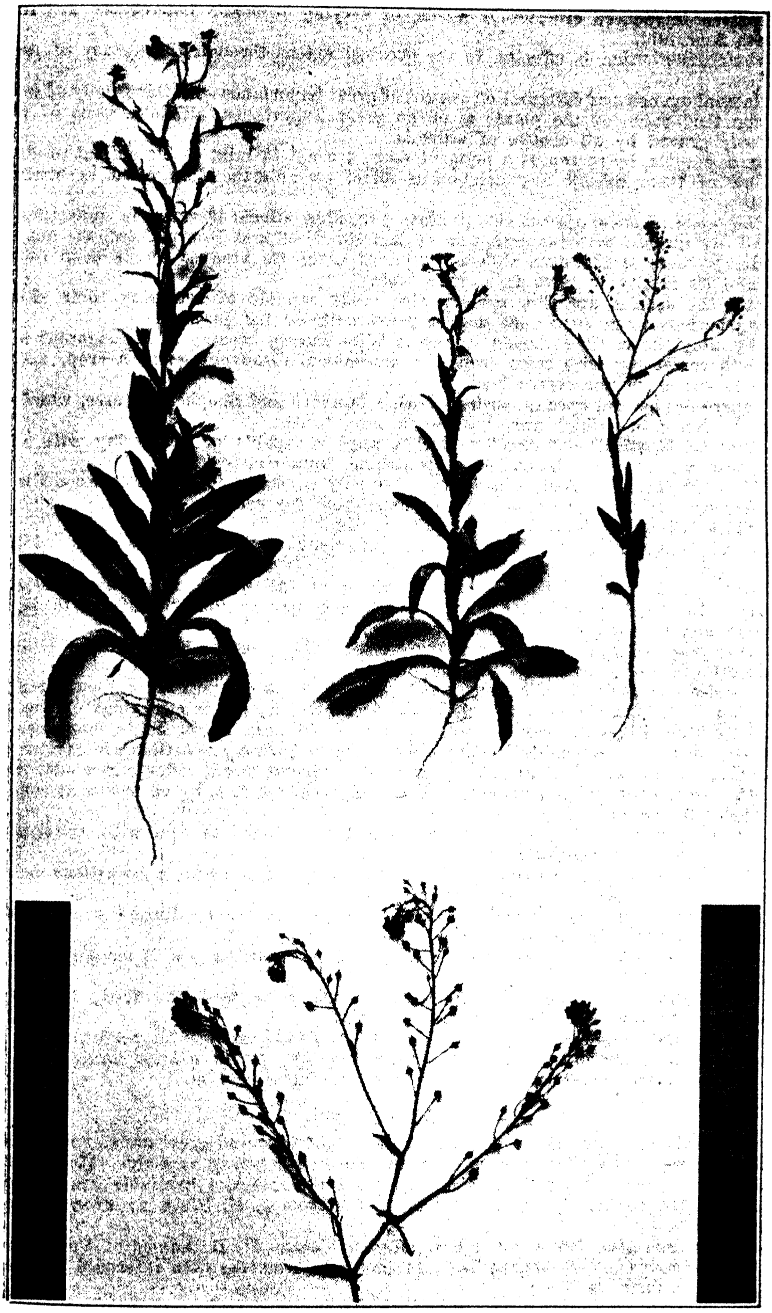
Distribution.—As far as known at present the plant is localised to the area north of Gawler to Wasleys, extending from that point through Reeve's Plains to Lewiston on the Gawler River.

Its Agricultural Importance.—A free seeder, capable of vigorous growth which will compete with any sown crop. This competitive feature is the most serious attribute of the weed. It does not develop the thick stems likely to cause trouble in hay harvesting, nor does the flowering branch create the mechanical disabilities found in others of the family. It is probable that the seed retains its vitality for a number of years, awaiting suitable conditions in which to germinate. In pasture the weed is not eaten by stock, its coarse, hairy nature rendering it unpalatable to all animals.

It is capable of development in cultivated soils and those that do not receive such treatment. The first specimens recorded in this State were taken from the railway yard at Roseworthy, but although this is so it shows a decided preference for land which periodically comes under cultivation.

Control.—Efficient fallowing and cultivating methods are sufficient to keep this weed in check. In a general way, provided that no disease or unfavorable conditions occur for the cereals sown, there does not appear to be any considerable difficulty with this plant. A vigorous growing cereal will completely eclipse it.

Soil Favored.—The general impression gained so far suggests that a free-working loam is most suitable for this weed. So far no instance of a heavy infestation has been observed in any other class of soil. Occasionally some of it is to be found growing on light sands, but these types do not seem to be greatly appreciated by it.



Neslia paniculata (Ball Mustard.)

SUMMARY.

1. Fifteen introduced cruciferous weeds, of varying economic importance, are found in South Australia.

2. Their distribution is effected to the greatest extent through the agency of man's activities.

3. Natural agencies of distribution are not of great importance with this family of weeds.

4. The feed value of the plants is of no great importance, although some of them are freely grazed by all classes of animals.

5. Some species, by reason of a pungent odor, are apt to taint edible animal products.

6. Few of them exhibit any deleterious effect on animals if ingested in moderate quantities.

7. The seeds of some species can produce poisoning effects if eaten in quantities.

8. All the species, with the exception of Lincoln Weed and Hoary Cress, are annuals.

9. Hoary Cress is the most difficult weed to eradicate because of its deep rooting habit and its ability to grow from such roots.

10. All the species are free seeders with seeds capable of retaining their vitality for long periods when conditions do not prove suitable for germination.

11. Possibly the worst economic species is Wild Turnip because of its vigorous habit of growth competing with sown crops, its mechanical disadvantage in a crop, and its ability to thrive on non-arable land.

12. There are several species, such as Hedge Mustard and Shepherds Purse, which can always be found but which are of no great importance.

13. Smooth Mustard and London Rocket appear capable of competing with other herbage, to its exclusion, in situations protected from livestock.

14. Wild Mustard is widely distributed, but only causes serious trouble when disease or inefficient cultivation renders the soil unsuitable for cereals.

15. Stock will graze Wild Mustard quite freely.

17. Sand Rocket and Lincoln Weed are disagreeable smelling weeds likely to taint animal products.

18. Sand Rocket necessitates frequent working of fallow in many coastal districts.

19. Lincoln Weed necessitates similar conditions, but is almost confined to Eyre's Peninsula and to light sandy or calcareous soils.

20. Dog Mustard is a weed to be regarded seriously because of its ability to cause mechanical difficulties in harvesting operations.

21. *Carrichtera annua* is a serious weed because of its competitive ability for space on the land. It would appear to lend itself to control by special workings of the soil.

22. Ball Mustard is at present isolated to a small area in the State, but does not appear to offer very serious difficulties where efficient farming practices are carried out.

23. Wild Radish does not appear to be a very serious weed under our conditions.

24. Charlock, when given a chance, is a serious weed, but it is by no means as common as is generally believed.

25. Buchan Weed is very common and is a difficult weed to deal with, particularly where sheep are not regularly kept.

26. Control of all the annuals lies in producing the best possible conditions for the growth of cereals and their correct time of sowing.

27. The use of harrows after the crop is up to prevent the seedlings becoming established should always be entertained.

28. Control of Hoary Cress is very difficult; its eradication is still more so, but not beyond achievement.

29. Great care should be exhibited in the purchase of seed and feed; the former should never be sown without being first graded.

30. Hand destruction of any suspicious plant should always be performed at the first indication of flowers; be sure and return to the spot at a later date.

31. Any unknown plant should be forwarded for identification.

ACKNOWLEDGMENTS.

An acknowledgment is due to Miss H. Frost for the time and great assistance rendered by drawing specimens, illustrations of which were not already available. Her patience and ability in achieving such illustrations from the material available are deserving of my greatest thanks. Other drawings are taken from J. M. Black's "Flora of South Australia."

My thanks are also due to my fellow officers, Messrs. H. D. Adams of Port Lincoln and W. H. Brownrigg of Streaky Bay, for much information with reference to Lincoln Weed in their districts.

REFERENCES.

1. J. M. Black: Flora of South Australia.
2. L. H. Pammel: Manual of Poisonous Plants.
3. H. C. Long: Plants Poisonous to Livestock.
4. H. C. Long: Common Weeds of the Farm and Garden.
5. A. Morgan: *Victorian Journal of Agriculture*, August, 1931.
6. W. E. Brenchley: Weeds on the Farm.

ANNUAL WINTER SCHOOL FOR FARMERS, 1933.

The Annual Winter School for Farmers will be held at Roseworthy Agricultural College from the morning of August 2nd to the morning of August 11th. In the following curriculum, which has been arranged for the School, the morning sessions, unless otherwise indicated, will be devoted to lectures, the afternoon sessions to outdoor demonstrations accompanied by lecturettes on the subject, and the evening sessions to illustrated lectures of a general nature.

Conditions for enrolment have been circularised to all Branches of the Agricultural Bureau; non-members of the Bureau will be supplied with these on application.

Rural producers living in the environs of the College are cordially invited to attend any or all of these lectures or demonstrations. Meals can be obtained at 1s. 6d. each, provided the Housemaster is advised a short time beforehand.

CURRICULUM.

Wednesday, August 2nd.

10.30 a.m.	Opening of the School	Minister of Agriculture (Hon. A. P. Blesing)
1 to 4 p.m.	Inspection of the College Farm	Mr. O. Bowden
7.30 p.m.	Cereal Diseases	Mr. G. Samuel

Thursday, August 3rd.

8 to 9.30 a.m.	The Management of Dairy Cattle	Mr. R. Baker
10 to 11.30 a.m.	Legislation Concerning Livestock	Mr. C. A. Loxton
1 to 4 p.m.	Farm and Homestead Fencing	Mr. O. Bowden and Lecturers of Cement Association
7.30 p.m.	Care and Management of Stud Horses	Mr. W. J. Dawkins

Friday, August 4th.

8 to 9.30 a.m.	A Talk on Wine Making	Mr. J. L Williams
10 to 11.30 a.m.	The Green Plant as a Factory	Mr. G. H. Clarke
1 to 4 p.m.	The Wool Clip and How to Class It	Mr. C. A. Goddard
7.30 p.m.	The Manufacture and Utilisation of Ensilage	Mr. W. J. Spafford

Saturday, August 5th.

8 to 10 a.m.	Common Ailments of Livestock	Mr W. G. Bennett

Monday, August 7th.

10 to 11.30 a.m.	New Ideas in Pig Breeding, Feeding, and Market Requirements	Mr. H. B. Barlow
1 to 4 p.m.	Swine Husbandry and Bacon Curing	Messrs. H. B. Barlow and Baker
7.30 p.m.	Grassland Improvement	Professor A. E. V. Richardson

Tuesday, August 8th.

8 to 9.30 a.m.	The Farmer's Poultry Run	Mr. F. W. Gilbert
10 to 11.30 a.m.	The Choice of Cereal Varieties by the Farmer	Mr. R. C. Scott
1 to 4 p.m.	Fat Lamb Production	Dr. A. R. Callaghan and Mr. S. Whicker
7.30 p.m.	Sources and Manufacture of Fertilisers	Mr. A. R. Hickinbotham

Wednesday, August 9th.

8 to 9.30 a.m.	Costs in Relation to Farm Records	Mr. W. H. Cowper
10 to 11.30 a.m.	Vine and Fruit Pruning Demonstration	Mr. J. L. Williams
1 to 4 p.m.	Farm Machinery	Mr. S. Shepherd
7.30 p.m.	Soil Fertility	Professor J. A. Prescott

Thursday, August 10th.

8 to 9.30 a.m.	The Chemistry of Foodstuffs	Mr. A. R. Hickinbotham
10 to 11.30 a.m.	The Underlying Principles of Feeding	Mr. W. G. Bennett
1 to 4 p.m.	Cereal Breeding and the Production of Pure Seed	Dr. A. R. Callaghan
7.30 p.m.	The R. A. & H. Society	Mr. H. J Finnis

ALLAN R. CALLAGHAN, *Principal.*

SOME OF THE EFFECTS OF COPPER CARBONATE ON THE WEIGHT PER BUSHEL OF SEED WHEAT.

[By Mr. W. C. JOHNSTON, R.D.A., Agricultural Instructor.]

The Blyth Seed Wheat Competition was designed to improve the average seed sown throughout the district. The rules of the competition provide that the samples for judging are to be taken from a bulk of not less than ten bags of grain. With the advance of modern methods of treating seed—*i.e.*, grading and pickling in one operation—this rule has caused some inconvenience to entrants, in so far as it has involved the preparation of 10 bags of unpickled seed for each entry made in the competitions; and, as the sample taken for judging has only been a few pounds weight, the remaining bulk had to be sown without pickling, or pickled separately, or held over till the following season. In cases of three or four entries, considerable work has been necessary to get adequate supplies of bulk seed from which to draw the required samples for judging. Naturally farmers were not inclined to make the extra effort, so that a movement has been growing to have the samples for judging taken from the seed wheat as it is prepared ready for the paddock. If this idea is accepted as a new rule it will necessitate the judging of pickled seed, and as copper carbonate at present is the most popular form of pickle, the rule, if adopted, will mean the judging of seed wheat pickled with this material. Those who use any other form of pickle or who do not pickle would, of course, not be eligible for the competition.

With the object of obtaining some information on the effect of copper carbonate in relation to the weight per bushel of wheat, some samples were obtained and treated with this material, weighings being taken both before and after the pickle had been added.

PROCEDURE.

Six samples of grain were obtained from the surplus of the entries in the Blyth Seed Wheat Competition for 1933, together with two samples of very pinched grain and one commercial sample.

These were individually weighed by means of a chondrometer and the weights recorded. In all, twenty weighings were made, which were designated numerically, and as more than one weighing was obtained from the Blyth samples, each of these weighings was further distinguished alphabetically. No. 14, however, was a composite sample made up of small quantities of grain from A, B, C, D, and E. The competition samples had been graded, but no attempt was made to reclean the pinched and commercial samples.

To the volume of wheat held by the cylinder of the chondrometer was added .25 drachm of copper carbonate, this quantity being estimated to approximate 1/60th of the pickling rate of 1oz. per bushel. The carbonate and wheat were transferred to an airtight receptacle, which was vigorously shaken in such a manner as to imitate, as closely as possible, the action of a commercial pickler. After being shaken in this way the wheat was again weighed by means of the chondrometer and the results noted. A similar quantity of copper carbonate was then added to the original quantity of wheat, thus giving a pickling rate of 2ozs. per bushel. The process of stirring was repeated and weights recorded. After the process had been repeated, *i.e.*, finally pickled at the rate of 2ozs. per bushel, the mixing receptacle and the chondrometer cylinder were carefully cleansed of any adhering carbonate, so as to prevent the possibility of accumulating residues exerting an influence on subsequent samples.

RESULTS.

Weight of Unpickled Grain.

Wide variations occurred between the samples of grain weighed, the heaviest sample being 64.5lbs. per bushel and the lightest 43lbs. per bushel. The average variations between the different weighings of the same samples was found to be approximately 1lb. per bushel. This feature will be of importance when considering the variations produced by the addition of carbonate of copper.

A fact worthy of note was the lack of uniformity in the individual weighings of the same bulk samples; this showed widest difference between C 6 and C 8, where a variation of 2lbs. per bushel was obtained. In the opposite direction, only in two instances did weighings from respective samples coincide: these were E 11 and 13, F 16 and 17.

The Effect of 1oz. per bushel of Pickle.

The addition of the pickle caused an increase in the volume of the wheat so treated. No attempt was made to measure this increase, but it was invariably found that whereas a given quantity of wheat would pack into the weighing of cylinder of the chondrometer prior to pickling, after this operation had been executed the same wheat more than filled the cylinder.

The increase in volume appears to be due to the greater friction between the individual grains, caused by the adhering powder, preventing their close packing.

The increase in volume is reflected in the reduction of bushel weight, for it was found, without exception, there was a decided falling off in weight after pickling. In a general way the heavier the sample prior to pickling the greater the reduction in weight brought about by this operation. Discrepancies occur, however, as is seen to be the case with C 6 and E 13; both were of similar weight before pickling, but the former lost 6lbs., while the latter was reduced by only 5lbs. It will also be noted that the pickle appears to have the effect of evening up the weights of treated grain.

In the unpickled samples the maximum variation was 3.25lbs. per bushel, as occurring between D 9 and F 16 and 17, respectively, whereas the maximum variation in the grain, pickled at the 1oz. per bushel rate, was 2.75lbs. per bushel, as shown by comparing E 13 and 14 with F 15 and 16 respectively.

In these calculations no account has been taken of 18-20, as it was considered best to keep such deductions to cleaned seed wheat.

The Effect of an Additional Ounce of Copper Carbonate.

In view of the fact that considerable reduction in weight per bushel was brought about by the addition of one ounce of copper carbonate per bushel, it would be reasonable to expect a further reduction by the addition of another ounce per bushel of powder. The additional ounce brings the rate of application up to that usually recommended, but no appreciable difference was, however, obtained. In fact, after reviewing all of the samples, there was no alteration in weight in 55 per cent. of them, while in 35 per cent. there were increases from .25 to .5lbs., and in 10 per cent. there was a reduction in weight. The total variation caused by the addition of extra pickle was represented by 3.25lbs., or an average of .2lb. for all samples treated. So small a variation in the weight per bushel of grain pickled at the greater rate occurred as to be considered negligible.

Particularly so, in view of the fact that variations of upwards of 2lbs. occurred between different weighings of the same samples, *e.g.*, C 6 and C 8 prior to pickling.

Table Showing the Effect of Copper Carbonate on the Weight per Bushel of Wheat.

Sample and Lots.	Weight of Unpickled Grain.	Weight of Pickled Grain.		Gain or Loss for 1oz. Pickling.	Extra Gain or Loss for Additional oz. of Pickle.
		One Ounce.	Two Ounces.		
	Lbs. per Bushel.	Lbs. per Bushel.	Lbs. per Bushel.	Lbs. per Bushel.	Lbs. per Bushel.
A1	64	58	58·25	6	+·25
A2	63·5	58·25	58·25	5·25	—
A3	63·25	58·25	58·25	5	—
B4	62·5	57·5	57·5	5	—
B5	61·5	57	57·5	4·5	+·5
C6	64	58	58	6	—
C7	63·5	57·5	58	6	+·5
C8	62	57·5	58	4·5	+·5
D9	64·5	58·5	59	6	+·5
D10	64·25	58·5	58 75	5·75	+·25
E11	64	58·75	58·75	5·75	—
E12	64·5	58·5	58·5	6	—
E13	64	59	59	5	—
14	63·25	59	58·75	4·25	—·25
F15	62	56·25	56·25	5·75	—
F16	62·25	56·25	56·5	5	+·25
F17	61·25	57	56·75	4·25	—·25
18	49·5	47·5	47·5	2	—
19	43	41	41	2	—
20	53·5	50	50	3·5	—

The Effect of the Pickle on the Appearance of the Grain.

From a point of view of Competitions, the addition of copper carbonate greatly reduces the attractiveness of the grain. All samples so treated become very dull and lose all the characteristic bloom and brightness. This loss of bloom would be considered detrimental in an ordinary way, but if all the samples were so treated this objection would be overcome.

The adhering powder would also obscure the possibility of discerning any spores of diseases which may be adhering to the grain.

CONCLUSIONS.

1. Copper carbonate reduces the weight per bushel of seed wheat to which it is applied as a pickle.

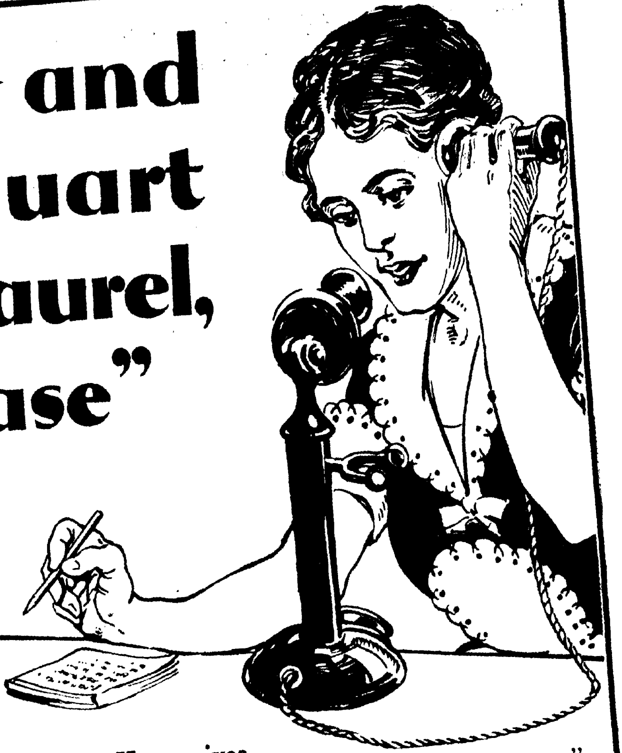
2. Applied at the rate of 1oz. per bushel copper carbonate reduces the weight of seed wheat equally as much as does a 2-oz. application of the powder.

3. In a general way the heavier the weight per bushel of wheat the greater will its loss of weight be after applying copper carbonate as a pickle.

4. Copper carbonate reduces the bright attractive color of the grain.

5. Copper carbonate may prevent spores of disease, possibly adhering to the grains, being seen.

“-- and a quart of Laurel, please”



Thousands of Housewives make it a practice to say those two words—“Laurel, please” when ordering Kerosene. They realise the sheer common sense of it! How many Housewives would say to their Grocers—“Send me some tea”—implying “any old tea will do”? Few, if any. Why it simply isn't done nowadays with so many brands of things—and such big variations in quality. No! To name the brand is wisest. Always say “Laurel”—then you'll get the most popular kerosene, most popular because unequalled in quality.

VACUUM OIL CO.
PTY. LTD.

LAUREL
Kerosene

Always say “LAUREL” not just “kerosene”

THE USE OF CHEMICALLY TREATED CORRUGATED BANDS AS A SUPPLEMENTARY CONTROL FOR CODLIN MOTH.

EXPERIMENTS CARRIED OUT AT STATE ORCHARD, BLACKWOOD.

[By R. Fowler, Manager Government Experimental Orchard, Blackwood.]

The use of chemically treated bands as an adjunct to spraying for the control of codlin moth was first brought into prominence in America in 1930 by E. H. Seigler and F. Munger. Since that time new facts have been discovered and improvements made as the result of further trials and experiments, and at the present time chemically treated codlin moth bands are available which are claimed to be as nearly perfect for the purpose as they can be made. Supplies of these bands have been manufactured and made available in Australia, and the Department of Agriculture took steps last season to obtain 100ft. of the material for testing purposes at the State Experimental Orchard, at Blackwood.

The material came to hand in late December, and the bands were applied to the trees on December 23rd. 100ft. of the material proved sufficient to bandage 50 average sized trees. The trunks of the trees to be bandaged were carefully scraped, all rough bark, &c., being carefully removed, so that fewer hiding places would be left for the codlin grubs. The bands were adjusted as firmly as possible with the special clips provided. As the bands are prepared of corrugated cardboard which is rather easily torn, care had to be exercised when attempting to fit the bandage snugly to the tree. It is also necessary to see that as little of the chemical coating as possible is lost when handling the bandage.

As it was realised that each day's exposure would probably impair the toxic properties of the chemical coating, a few trees were first bandaged with the ordinary bag bandages usually employed, and when it was found that grubs were seeking refuge in these bands, the chemically treated bandages were applied. As before stated this was done on December 23rd, and the grubs caught represented the larvae from the spring brood of moths.

In order to ascertain the movements of the grubs and to check the possibility of them passing unharmed over the chemical bands, an ordinary bag bandage was applied some inches above the treated bands on the assumption that most of the grubs, after leaving the fruit, would reach the ground and crawl back to the tree for the purpose of finding a dark protected place in which to spin their cocoons. Whether all the grubs would behave in this manner is not certain, and it is quite possible that some of them, after leaving the fruit, might alight on a large limb and crawl down to the trunk to find shelter. Later in the season, when the grubs are leaving the more mature fruits, it is probable that a large proportion of them will fall to the ground while still in the fruit, as it is well known that apples, when badly damaged by codlin grubs, fall prematurely. To gain further information on this point later in the season, ordinary bandages were applied above and below a limited number of chemical bands, and records were made of the grubs caught. Records were also kept of the grubs caught in ordinary bandages placed on trees on which no chemically treated bands were used. The data collected is shown in Table I.

It will be noticed that up to the final inspection on June 6th, many more grubs were recorded from the ordinary bandages than from the chemically treated bands —714 as against 197—and this seemed to suggest that either the grubs were passing over the treated bands without injury or were moving downwards from the branches. It was not possible at this time to record the grubs which sought to spin their cocoons in the inner channels of the corrugated card boards. When the bands were finally torn apart it was found that quite a number had harbored in the inner folds; the final examination revealed a count of only 80 grubs in the ordinary bandage and 513 in the chemical bands. From the dried up condition of the grubs found in the inner folds I think it is safe to assume that the catch represented the full number of grubs that had entered the bandages during the season.

In the final examination on June 6th, 1933, it was found that of the 513 grubs then in the chemical bandages 138 were apparently alive. That they had been in some way affected by the toxic properties of the bandage was apparent, as instead of showing the natural creamy white color they had changed to a reddish-brown, usually with a very dark line showing right along the back. It appeared more than probable that most of these affected grubs would die before next spring, or that their future development would be seriously interfered with. The cocoons have been collected and placed in a breeding cage with a view to gaining some information on this point.

The fact that so many live grubs were found in the bandages towards the end of the season indicates that the killing action of the band becomes slower, and it might be advisable to delay the removal of the bands until late winter, to insure that the grubs in the cocoons still attached to the tree trunk are killed. The bands may be conveniently destroyed by burning when finished with.

From the data collected and shown in Table I. it would seem that the chemical bands are, roughly, 50 per cent. efficient, that is to say, that of the total number of grubs moving about in the tree half of them will be trapped and killed by the bands. In an orchard heavily infested with codlin this would represent a considerable number of grubs, and, as the effect would be cumulative, the bands should materially assist in reducing the codlin moth population in the orchard. The question of cost has to be considered, as, unfortunately, at present the chemical bands are relatively expensive, but that is a matter for the individual grower to decide, taking into consideration his own particular set of conditions.

The chemically treated bands will not do away with the necessity for spray measures, but as they will automatically kill practically all of the codlin moth larvae that remain in contact with them, they should materially help in the control of codlin in the orchard, particularly where the practice of applying and examining regularly the usual bag bandage is not carried out.

It would seem advisable to use the chemical bands only on well developed trees with mature rough bark, as it was noticed that the area under the bands become oily and somewhat dark colored, but apparently no injury has resulted so far. If used in successive seasons on the same tree, it would probably be wise to apply the bands in a different position each year.

It was also noted that bands taken from trees affected with woolly aphis contained thousands of dead aphides, evidently caught while migrating to the roots for the winter. From the results, therefore, of one season's tests it would seem that the chemical bands have given fairly good results, and the experiment is worth further trial.

o

TABLE 1.—*Data Relative to Codlin Moth Trapping Tests with Chemically Treated and Other Bandages, Blackwood, Season* 1932-33.

50 Chemical and 50 Ordinary Bag Bandages.

Date of Examination.	Grubs Caught in Bag Bandage over Chemical Bandage.	Date Examined.	Grubs Caught in Chemical Bandage.	Date of Examination.	Grubs Caught in Single Bag Bandage.	Test with 3 Bandages in each of 6 Trees.			
						Date Examined.	Top Bag Bandage.	Middle Chemical Bandage.	Bottom Bag Bandage.
6/1/33	26	6/1/33	9	—	—	6/6/33	36	12	39
13/1/33	72	—	—	—	—	—	—	†54	—
23/1/33	92	26/1/33	41	—	—	—	—	—	—
30/1/33	40	—	—	30/1/33	16	—	—	—	—
6/2/33	55	—	—	6/2/33	27	—	—	—	—
13/2/33	61	13/2/33	45	13/2/33	18	—	—	—	—
20/2/33	107	20/2/33	43	20/2/33	12	—	—	—	—
28/2/33	119	28/2/33	43	—	—	—	—	—	—
16/3/33	121	—	—	16/3/33	60	—	—	—	—
27/3/33	21	27/3/33	16	27/3/33	5	—	—	—	—
6/6/33	80	*6/6/33	513	6/6/33	118	—	—	—	—
	794		710		256	—	—	—	—

Total grubs caught in 50 chemical bandages, 764.
Total grubs caught in 50 bag bandages, 869.

* Chemical bandages were subsequently examined after being torn apart, when 138 live and 375 dead grubs were counted.

† Chemical bandages, when subsequently torn apart and examined, contained 54 live grubs, some of which had probably been in the bandage some time.

REGISTRATION OF DRAUGHT STALLIONS.

DRAUGHT STALLIONS ACT, 1932.

This Act provides for the registration and examination of draught stallions, and came into force on July 1st, 1933.

The Act applies to those portions of the State within any hundred, but hundreds in the counties of Flinders, Musgrave, Jervois, Robinson, Le Hunte, Buxton, York, Hopetoun, Kintore, Way, Dufferin, Bosanquet, Manchester, Blatchford, Hanson, and Taunton have been exempted.

The area coming within the operation of the Act therefore includes all the agricultural portion of the State, except Eyre's Peninsula and that part north of the town of Wilson.

After the first day of July all draught stallions which are two years old and over, except those in the exempt areas, must be registered.

Applications for registration must be made to the Chief Veterinary Officer, Stock and Brands Department, Adelaide, and should be accompanied by the registration fee of £1 1s.

Registrations terminate on June 30th in each year, and must be renewed annually.

In addition to being registered, all draught stallions plying for hire must possess a Government certificate of soundness.

Applications for examination of draught stallions for a Government certificate of soundness should be made to the Chief Veterinary Officer, Stock and Brands Department, Adelaide, and should be accompanied by the examination fee of £1 1s.

A certificate of soundness will remain in force until June 30th following the issue thereof in the case of draught stallions 2, 3, and 4 years old, and in the case of draught stallions 5 years old and over will be issued for life.

A stallion in respect of which a life certificate was issued before the Act came into force does not require re-examination.

A certificate of soundness is not compulsory in the case of a stallion which is used exclusively for the service of mares which are the sole property of the owner of the stallion.

Stallion parades will be arranged as soon as possible at convenient centres for the examination of stallions, and early application will facilitate the arrangement of these parades.

LIFE — A BUSINESS

It is a paradox, perhaps, that while Home Life is a refuge from business, it is itself a business.

Money enters so largely into everything that it must be planned for in every phase of life.

It is in business that money is earned, in the Home, chiefly, that it is spent, and there is no sound reason why the spending should not be regarded as being just as important as earning. In fact, it is far more important, for earning is difficult and must employ wisdom, forethought, and energy, while spending is easy, so easy that there is temptation to spend unwisely.

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Owners who are unable to submit their draught stallions at an inspection parade arranged by the Department may have their stallions examined at a special parade. In this case an additional fee will be charged as well as all transport expenses of the special visit.

The owner of a draught stallion must give the examining officer all particulars relating to the draught stallion such as age, breeder, pedigree, prior ownership, etc., as may be required.

The hereditary diseases for which a certificate of soundness will be refused will be those which were recognised in this State under the old voluntary system and which are scheduled in all the other States of the Commonwealth where legislation for the examination of stallions is in force.

As the Act does not provide for an approved standard—type, breeding, and conformation will not be considered.

When a certificate of soundness is refused, the owner will be advised in writing within 14 days, and will be informed of the reason for refusal.

When a certificate of soundness has been refused, the owner may, by notice in writing, apply to the Chief Veterinary Officer to have his stallion examined by an appeal board. This application must be made within 30 days of the notice of the refusal of a certificate, and must be accompanied by a fee of £5 and the costs of the appeal, including the fee, will, if the appeal is successful, be returned to the applicant.

If any certificate of registration or soundness is lost or destroyed, the owner may, on application to the Chief Veterinary Officer and by paying a fee of ten shillings, obtain a duplicate certificate.

The owner of a draught stallion must give notice to the Chief Veterinary Officer of any sale, or letting, or change in ownership, or of the castration or death of a draught stallion, and return the certificates of registration and soundness.

When any change takes place in the ownership of a draught stallion, the new owner must apply for a transfer of the registration and pay the transfer fee of ten shillings.

A certificate of soundness will be granted without examination in respect of a stallion which has, after examination, been granted a Government certificate of soundness in any State of the Commonwealth, or the Dominion of New Zealand. A certificate so issued will expire on June 30th following in the case of stallions under five years old, and will be issued for life in the case of stallions five years old and over. Such certificates may be obtained by application to the Chief Veterinary Officer accompanied by the certificate aforesaid and a fee of £1 1s.

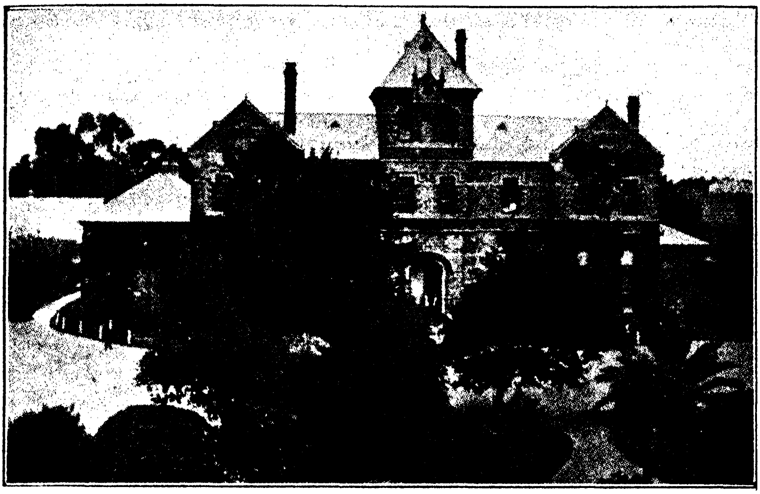
The person in charge of a draught stallion must produce the certificate of registration and the certificate of soundness if required to do so by a member of the police force or by an officer of the Stock and Brands Department authorised by the Minister.

The owner of a mare may require the production of a Government certificate of soundness at the time of or before the service of his mare.

The principal offences against the Act are:—

Keeping an unregistered draught stallion; using for stud purposes a draught stallion which is not certificated; failing to produce a certificate of registration or soundness as required by the Act; failing to notify any sale, letting, change of ownership, castration, or death of a draught stallion; knowingly giving a false answer to any question of a veterinary officer while carrying out the provisions of the Act; submitting a draught stallion for re-examination which has previously been refused a certificate of soundness.

Any further information relating to the Act may be obtained from the Chief Veterinary Officer, and forms of application for registration and examination for soundness, &c., may be obtained from the Stock and Brands Department, District Inspectors of Stock, or from the nearest Police Officer.



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GRASS HAY COMPETITION.

SOUTH-EASTERN DISTRICT, SEASON 1933.

[Judged by E. S. Alcock, District Agricultural Instructor.]

The grass hay competition conducted by the South Australian Advisory Dairy Board in the South-Eastern districts of this State attracted eight entries, which were judged towards the end of March, utilising the following scale of points:—

	Points.
Suitability of plants	25
Curing	25
Stage of cutting	15
Apparent nutritive value	25
Storing	10
Total	100

The points awarded and the comments of the judge were as follows:—

Position.	Name.	Address.	Suitability of Plants.	Curing.	Stage of Cutting.	Apparent Nutritive Value.	Storing.	Total.
		Max.—	25	25	15	25	10	100
1	I. Sims (2)	Glencoe	23	24	14	22	9	92
2	T. Hemmings	Kalangadoo	23	22	13	21	8	87
3	W. K. Chambers	Mil Lel	22	23	13	21	7	86
4	F. C. Caine	Kongorong	22	23	14	20	6	85
5	I. Sims (1)	Glencoe	21	20	12	19	7	79
6	L. S. Davie.	Kybybolite	20	20	12	20	6	78
6	A. Robinson	Mil Lel	24	16	13	19	6	78
8	J. Dow	Glencoe	19	17	13	19	6	74

1. *I. Sims, Glencoe* (2).

A very creditable entry. The hay was cut from selected areas in a pasture field, and was made up of a mixture of Slender Clover, Burr Clover, Subterranean Clover, Perennial Rye Grass, and Yorkshire Fog Grass.

The curing had been closely watched and the material well handled, drying out to a very good color.

It had been cut before the grasses had become too mature, although more attention could have been given in this direction.

There was a little bleaching, but the apparent nutritive value was good, whilst the material was well stacked and carefully thatched.

2. *T. Hemmings, Kalangadoo.*

The hay consisted chiefly of Subterranean Clover with some Silver Grass, Sterile Brome, Wallaby Grass, Barley Grass, and Cape Weed.

For the production of best quality hay the crop should have been cut a little earlier and carted to the stack sooner; it was too mature, and also bleached in the weather.

The grasses present were not of the best types for full nutritive value, and the inclusion of some Perennial Rye Grass would have improved the feeding value of this material.

The stack was not thatched, but protected from the weather by means of hessian.

3. *W. K. Chambers, Mil Lel.*

The proportion of legumes in this entry was too great for the production of really good hay, as the material consisted mainly of Subterranean Clover, together with a little Lucerne. The few grasses present were of relatively low feeding value, such as Sterile Brome, Soft Brome, Silver Grass, Hare's Tail Grass, and Cape Weed.

Care had been displayed in deciding the stage of cutting and carting, as the hay was of good quality regarding both maturity and curing of the plants.

More attention could have been given to the storing of the hay, for although the stack was well built, no provision for protection from wet weather by thatching or other means had been made.

4. *F. C. Caine, Kongorong.*

A very good pasture mixture had been seeded in the field from which the hay entered for competition had been cut, but this season the clovers predominated over the grasses. The hay comprised a mixture of Subterranean Clover and some Mount Schank Clover, with lesser quantities of Perennial Rye Grass, Cocksfoot, Yorkshire Fog, Sterile Brome, and Silver Grass.

South-East Grass Hay Competition—The winning stack of Mr. I. Sims, Glencoe.

The crop had been cut at the correct stage of maturity, and also carted in sufficiently early to permit of the hay curing out satisfactorily. However, points were lost because of the absence of adequate protection of the stack, both from rain and moisture working up from below.

5. *I. Sims, Glencoe* (1).

Some of the plants were not as suitable as those in the winning entry, for they consisted of a mixture of Perennial Rye Grass, Yorkshire Fog, Rooted Cats-ear, Silver Grass, Slender Clover, Mount Schank Clover, Subterranean Clover, and a little Bartsia.

Then this crop had been allowed to become over-ripe before cutting, and had also been left too long in the field, with the result that it was rather harsh and dry.

The proportion of mature grasses affected the apparent nutritive value, but the stack was fairly well built and thatched.

6. *L. S. Davie, Kybybolite.*

The hay submitted by Mr. Davie consisted mostly of Subterranean Clover with some Sterile Brome, Soft Brome, Barley Grass, Wallaby Grass, Silver Grass, Cape Weed, and a few thistles. The majority of grasses were not of high feeding value, whilst some were too far advanced, being in full ear at the time of cutting. The clover was harvested at a suitable stage, but points were lost in curing, because of delay in carting.

Stock consumed the hay fairly readily, although the inclusion of better grasses and earlier cutting would have increased its value.

Stacking and thatching were satisfactory, but no protection from stock was provided, and the animals simply helped themselves. This would result in considerable wastage should wet weather be experienced.

7. *A. Robinson, Mil Lel.*

The pasture mixture utilised for this entry was well balanced, consisting of the grasses and clovers growing naturally in the district, together with some Algerian oats. Cutting was done in good time, but it was unfortunate that Mr. Robinson allowed the hay to be too long in the field, thus reducing its value very materially. It was fairly palatable to stock, but the weathering experienced affected the nutritive value. The stack was rather too low, and no protection from the weather had been provided.

8. *J. Dow, Glencoe.*

Contrary to the majority of entries examined, the hay submitted by Mr. Dow contained rather too high a proportion of grasses to clovers, thus indicating the need for additional phosphatic manuring.

The crop had been allowed to become too ripe, whilst delay in carting had occurred, with the result that the material did not offer high feeding value to livestock.

The stack was fairly well built, but not thatched.

Commenting on the entries, Mr. E. S. Alcock says that whilst the general quality of the material submitted is fairly satisfactory, there is room for much improvement, both in the quantity and quality of the grass hay conserved in the South-East as a whole.

It is obvious that the practice of allowing the annual growth to die off and then expecting it to maintain the maximum number of stock in good health is wrong, and the conserving of some of the abundant spring growth in some form or other should be a much more economical proposition.

In connection with the suitability of plants, many of the pastures need more attention, both in regard to top dressing and the sowing of suitable seeds. On much of the Subterranean Clover land Certified Rye Grass, Cocksfoot, and *Phalaris Tuberosa* could be successfully established. White Clover is also suitable for the better class lands, whilst Strawberry Clover will thrive in the damper peaty places.

For the production of first quality material, both skill and care are necessary. The crop should be cut when at its maximum growth, but not too far advanced toward maturity. For most plants the correct time would be when they are in the early stages of flowering. In a mixed pasture, therefore, a general average stage of maturity must be struck, bearing in mind the fact that it is better to lean toward the early condition rather than that the plants should become too ripe. As soon as the excess moisture is dried out—which under normal climatic conditions may only be a matter of a few days—the hay should be stacked. It will then retain its color, texture, and aroma, instead of becoming dry and harsh.

The lack of care exercised in storing is very surprising. Frequently no thatching of the stacks is adopted, whilst hay sheds are rarely seen. Moreover, in many cases no timber or straw is placed at the bottom of the stack to prevent damage from contact with the damp ground. If additional precautions in this direction were adopted, much wastage and danger of feeding troubles with animals would be avoided.

STATE OF SOUTH AUSTRALIA.

FINAL RESULTS OF CEREAL AND HAY HARVEST, 1932-33.

(W. L. Johnston, Government Statist.)

Wheat, 1932-33.—42,429,614bush.; average per acre, 10·43bush.

Wheat, 1931-32 (Record).—48,093,102bush.; average per acre, 11·81bush.

There are still a few minor wheat districts where the completion of the collection has been delayed and a number of odd returns from farmers in other districts outstanding, but, rather than further delay the final results, a safe estimate has been made for all these, and hence the totals now submitted may be accepted as final.

Growers and Acreage Sown.

Wheat Growers.—There were 15,438 (15,425) growers of wheat for all purposes for the season 1932-33, and of this number 14,467 (14,306) reaped areas for grain. Approximately 1,754 (1,787) reaped areas of under 50 acres. Share farmers counted once only.

Acreage.—The grand total acreage sown to wheat, barley, and oats for all purposes was 5,039,942 (5,094,393) acres, a decrease on the previous year of 54,451 acres.

Wheat.—4,274,096 (4,327,153) acres; grain, 4,066,782 (4,071,370) acres; hay, 205,372 (250,285); fed off, &c., 1,942 (5,498).

Barley.—322,958 (253,955) acres; grain, 314,286 (242,339); hay, 2,125 (4,254); and fed off, 6,547 (7,362).

Oats.—442,888 (513,285); grain, 174,244 (206,470); hay, 243,015 (273,375); fed off, &c., 25,629 (33,440).

Production and Averages per Acre.

Wheat.—42,429,614 (48,093,102) bushels, decrease 5,663,488bush., averaging 10·43 (11·81) bushels per acre.

Barley.—A record crop of 6,070,161 (4,572,941) bushels, increase 1,497,220bush., averaging 19·31 (18·87) bushels per acre. The previous best crop was 4,656,254bush. in 1929-30.

Oats.—1,788,712 (2,287,844) bushels, decrease 499,132bush. on record crop of previous year, averaging 10·27 (11·08) bushels per acre.

Hay (Wheaten, oaten, and barley).—547,060 (630,867) tons, decrease 83,807 tons, averaging 1·21 (1·20) tons per acre. Distributed as follows:—Wheaten, 278,875 (333,422); oaten, 265,845 (292,958); barley, 2,340 (4,487) tons.

Benefits from Fallowing.

In good seasons the difference in yields per acre of crops sown on fallow and crops on unfallowed land is less than in less favored seasons, as will be seen by noting the years 1931-32 and 1932-33 in comparing with 1929-30 and 1930-31.

Grown on—	Yield per Acre.			
	1932-33.	1931-32.	1930-31.	1929-30.
	Bush.	Bush.	Bush.	Bush.
Fallow	12·86	14·81	11·05	9·07
Not fallowed	6·86	7·57	5·48	2·84
Total	10·43	11·81	8·34	6·40
Rainfall—April-November	14·70	13·27	11·31	9·57

Of last season's wheat crop, 2,420,674 (2,385,441) acres sown on fallow yielded 31,129,859 (35,325,997) bushels, averaging 12·86 (14·81) bushels per acre, and 1,646,108 (1,685,929) acres sown on unfallowed land yielded 11,299,755 (12,767,105) bushels, averaging only 6·86 (7·57) bushels per acre, thus making the State average 10·43 (11·81) bushels per acre.

SEASONAL CONDITIONS.

Rainfall.—The mean monthly rainfall over the agricultural areas of the State is specially computed and recorded in comparison with the averages for the past 28 years. The following are the particulars in inches of the rainfall from April to November for the chief divisions of the State.

Year.	Wheat Average.	State.	Central.	Lower North.	Murray Mallee.	Western.
	Bush.	Ins.	Ins.	Ins.	Ins.	Ins.
1932	10·43	14·70	18·39	14·86	11·74	14·22
1931	11·81	13·27	16·92	12·62	10·36	12·57
Average 28 years	10·52	12·77	16·21	12·41	10·60	11·16

The average rainfall over the agricultural areas for the wheat-growing period (April-November, 1932) was 14·70 (13·27) inches, being the highest since 1923, when the rainfall was 15·43in. and the wheat average 14·29bush.

Disabilities.—Nearly up to harvest time, a record yield was expected, but during the last few weeks the crops in many districts were seriously affected by rust, takeall, rabbits, and unfavorable harvesting weather, reducing the average per acre to 10·43bush., compared with 11·81 bushels the previous year.

1. ACREAGE CROPPED.

Divisions.	Total Wheat, Barley, Oats.	Grain.			Hay (W.B.O.).	Fed Off Areas (W.B.O.).
		Wheat.	Barley.	Oats.		
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Central	1,010,549	622,701	226,189	26,411	128,976	6,272
Lower North	1,040,231	894,498	45,728	11,265	83,785	4,955
Upper North	434,786	409,821	658	1,016	23,188	103
South-Eastern	121,143	53,721	15,256	19,352	29,903	2,911
Western	1,307,331	1,155,191	16,139	59,902	67,004	9,095
Murray Mallee........	1,125,902	930,850	10,316	56,298	117,656	10,782
Total 1932-33	5,039,942	4,066,782	314,286	174,244	450,512	34,118
Total 1931-32	5,094,393	4,071,370	242,339	206,470	527,914	46,300
Increase or Decrease ..	—54,451	—4,588	71,947	—32,226	—77,402	—12,182

2. PRODUCTION OF GRAIN AND HAY.

Divisions.	Grain.						Hay (W.B.O.).
	Wheat.		Barley.		Oats.		
	Bush.	Av.	Bush.	Av.	Bush.	Av.	Tons.
Central	8,550,536	13·73	4,618,899	20·42	408,477	15·47	193,224
Lower North .	13,656,908	15·27	869,342	19·01	208,456	18·50	123,009
Upper North .	4,413,748	10·77	10,559	16·05	16,548	16·29	31,234
South-Eastern	619,727	11·54	321,251	21·06	306,332	15·83	38,220
Western	8,039,427	6·96	153,664	9·52	455,474	7·60	58,142
Murray Mallee	7,149,268	7·68	96,446	9·35	393,425	6·99	103,231
Total 1932-33.	42,429,614	10·43	6,070,161	19·31	1,788,712	10·27	547,060
Total 1931-32.	48,093,102	11·81	4,572,941	18·87	2,287,844	11·08	630,867
Increase or Decrease .	—5,663,488	—1·38	1,497,220	0·44	—499,132	—0·87	—83,807

3. Five Years' Comparison.

Year.	Wheat.			Rainfall Agric., April-Nov.	Value of Oversea Exports.	
	Area.	Yield.	Average per Acre.		Wheat and Flour.	Barley.
	Acres.	Bush.	Bush.	Ins.	£	£
1927-28...........	2,941,360	24,066,012	8·18	9·29	5,415,401	232,108
1928-29...........	3,445,563	26,826,094	7·79	9·39	3,911,088	211,099
1929-30...........	3,645,764	23,345,093	6·40	9·57	3,866,967	77,660
1930-31...........	4,180,513	34,871,526	8·34	11·31	3,037,811	342,732
1931-32...........	4,071,370	48,093,102	11·81	13·27	5,901,673	413,034
Mean.........	3,656,914	31,440,365	8·60	10·57	4,426,588	255,327
1932-33...........	4,066,782	42,429,614	10·43	14·70	4,619,762 10 months	230,911 10 months

THE GREAT GREY SLUG (*Limax maximus*).

Mr. R. Hill (Agricultural Instructor) states that specimens of slugs collected on the property of Mr. P. J. James at Inman Valley have been identified by Mr. Cotton, of the Adelaide Museum, as juveniles of the Great Grey Slug (*Limax maximus L.*), which commonly attain a length of 5in. to 6in. when adult. They are yellowish and grey in color, but there are many varieties of the species which inhabit woods, hedges, and gardens.

Lying hidden during the day they emerge at night, and eat almost anything, but are not particularly fond of green leaves. They also eat fungi, and have a very keen sense of smell. The variety is common all over the British Isles, and is dispersed throughout Europe. It has been introduced to North America, Cape Colony, and Australasia, being common in New South Wales.

When discovered on the above property they had made a clean sweep of young growth over an area of about eight acres, except on small sandy patches. The mixture sown was oats, Subterranean clover, and Wimmera rye grass seeded on a field which grew a crop of peas last season, and young plants have been nipped off at ground level.

Reference is made in the *Rural Cyclopedia* to the powerful attraction that pea haulms in a state of incipient decay have for slugs, and this has evidently been the attraction at Inman Valley. The same writer states that slugs never injure corn after fallow, but always after lea or clover.

Numerous methods of control have been advanced, but apart from fallowing and keeping the soil free of clods which harbor the slugs, the only other treatment which seems practicable is that mentioned in the *Western Australian Journal of Agriculture* of 1927 in an article by L. J. Newman, F.E.S., Entomologist, who recommends dusting the land during a fine day with a mixture of 1lb. of powdered bluestone to 14lbs. of lime, which paralyse the slugs when they emerge at night and come in contact with it. Mr. Newman states that slugs have considerable powers of increase, and soon become very numerous and destructive. The eggs, which are glossy, transparent, jelly-like objects, are laid in masses in the soil or under suitable shelter. These hatch in from 16 to 21 days into tiny slugs.

NELSHABY AGRICULTURAL BUREAU.

ANNUAL SEED WHEAT COMPETITION, 1933.

[Judged by Mr. E. L. ORCHARD, District Agricultural Instructor.]

This Competition, which is conducted by a committee of management chosen from the members of the above Branch of the Agricultural Bureau, has for its object the improvement of the quality of the grain sown in the district. Two pound samples drawn from a five-bag lot of each variety entered for competition were submitted for judging to the following scale of points:—

	Points.
Weight per bushel	25
Plumpness and evenness of grains	15
Freedom from visible admixture	15
Freedom from bunt, weed seeds, &c.	20
Freedom from injury in harvesting	15
Freedom from dirt, chaff, straw, &c.	10
Total	100 points

A total of eleven samples in all were presented for competition in the two classes for which trophies were offered, Class I. calling for a collection of two varieties of seed wheat, and Class II. constituting the Champion variety of Seed Wheat for which a trophy, presented by Mr. L. C. Roberts, was awarded to the single variety from all entries receiving the greatest total number of points.

Weight per Bushel.—This factor averaged 62½lbs. over the whole of the samples, that of Quality being the highest with 66¾lbs. per bushel, closely followed by Ford with 66lbs. An entry of Currawa registered the lowest bushel weight of 59½lbs., whilst the two of Waratah were consistent, with weighings midway between the highest and lowest. It is of interest to recall, in view of the very satisfactory weight of both the Quality and Ford, that these two wheats generally displayed a high degree of resistance to the rust trouble which proved so disastrous in the wheat fields of the farms situated in this district during the 1932 season, Ford in particular indicating its value under such circumstances.

Plumpness and Evenness of Grains.—No great amount of variation was to be found in this respect, and that only with reference to the evenness of the kernels. Exhibiting a fairly regular degree of plumpness, a little difference in size was apparent on close examination, although an average allotment of 12.25 points under this heading out of the possible 15 indicates no big defection.

Freedom from Visible Admixture.—This character was uniformly high also, there being no percentage of admixture which could be readily detected in any of the samples.

Freedom from Bunt, Weed Seeds, &c.—It was very pleasing to note the entire absence of wholly bunted grains, and if any spores of the disease were present they were insufficient to betray their whereabouts by their characteristic smell. Against this, however, weed seeds, especially in the form of barley, which came under notice in one or two of the most attractive entries, brought their total points down to below exhibits of lighter weight per bushel, and effectively wiped out the lead in points previously obtained.

Freedom from Injury in Harvesting.—A little cracked and over-threshed grain was noted in some of the samples, but collectively there would not be any very appreciable germinating loss from this cause. At the same time, one variety giving a good weight per bushel was sheltering a fair percentage of injured grains.

Freedom from Dirt, Chaff, Straw, &c.—Wheat glumes or chaff were principally to blame for a reduction in points in this regard, with now and again occasional stem knots or straw, the exhibits right through being free from dirt and straw generally.

The Placed Entries.—No. 1 entry of Waratah and Nabawa, the property of Mr. R. P. Noble, gains the award for best collection of Seed Wheat of two varieties, with a total of 177 points, that of No. 2, constituting the same varieties, filling second position with a total of 171.5 points.

For the Champion variety of Seed Wheat, No. 6 entry of Nabawa, made by Mr. C. G. Plenty, obtained the highest total of points of any one variety.

The Branch is to be highly commended on the successful conduct of a competition which has such an important bearing on the value of the harvested grain from our wheat lands, and the effort thus put forward has the whole-hearted support of those associated with our agricultural progress. The endeavor being made to encourage sowing the best in order to obtain the price which only quality commands eventually, although receiving attention from several of the Bureaux Branches, should be much more widely instituted, and competitions of this nature are exceedingly helpful in stimulating interest in that direction.

Annual Seed Wheat Competition, 1933.

No.	Name.	Variety.	*a.* 25.	*b.* 15.	*c.* 15.	*d.* 20.	*e.* 15.	*f.* 10.	Total Class II. 100.	Total Class I. 200.
1	R. P. Noble	Waratah ..	21·25	13	14	19·5	13	9	89·75	177·00
		Nabawa ...	19·75	12·5	14	20	14	7	87·25	
2	T. Davies	Waratah ..	21·50	12	14	20	12·5	7	87·00	171·50
		Nabawa ...	20·50	12	13	20	12	7	84·50	
3	L. C. Roberts	Sultan	18·25	12·5	14	17	13	7	81·75	168·25
		Currawa ...	21·00	12	14	19	13	7·5	86·50	
4	F. Lange	Quality ...	25·00	13	14	10	13	9	84·00	169·75
		Ford	24·25	12	14	16	11·5	8	85·75	
5	F. Jose	Currawa ...	17·75	11	14	19	13·5	6	81·25	164·75
		Nabawa ...	19·00	12	14	19	12	7·5	83·50	
6	C. G. Plenty	Nabawa ...	21·25	13	14	20	14	9	91·25	

(*a*) Weight per bushel.
(*b*) Plumpness and evenness of grains.
(*c*) Freedom from visible admixture.
(*d*) Freedom from bunt, weed seeds, &c.
(*e*) Freedom from injury in harvesting.
(*f*) Freedom from dirt, chaff, straw, &c.

STRANGLES.

Mr. C. McKenna, B.V.Sc., M.R.C.V.S. (Government Veterinary Officer) supplies the following treatment in response to many inquiries reporting strangles in horses. Strangles is a contagious disease of the horse and is chiefly spread by the contact of an affected horse with a healthy one. The disease has been very prevalent in the State during the past year, and in those cases which have come to my notice the history is that a horse has been purchased (usually at a horse sale) a short time before the outbreak of the disease.

Prevention.—1. Isolate any newly bought horses for two to three weeks. 2. Do not buy any horses showing a nasal discharge or swelling between the lower jaws. (It is also advisable to make your purchases well before harvest operations, as an outbreak of strangles can disorganise the farm teams). 3. There is a preventive vaccination, but its use is not advised for farm teams. 4. Isolate any horse showing signs of a cold or swelling under jaw and seek veterinary advice.

Cure.—The disease takes its course. Isolate, put out of work, keep warm, and give nourishing but light feed. Steaming of the nose is advisable. The swelling under the jaw should be fomented and lanced when ripe. Strangles vaccine is very useful in an outbreak of the disease. Advice should be sought as to how to use it.

HISTORY OF WHEAT GROWING IN SOUTH AUSTRALIA.

[By R. C. Scott, R.D.A., Supervisor of Experimental Work.]

Shortly after settlement commenced in South Australia the production of wheat was attempted, and it is on record that the first crop, covering an area of 20 acres, was planted by Messrs. Allan and John McLean, sons of a Scottish farmer, near Hilton, in 1838.

It is reported that prior to this date a small field had been seeded on Kangaroo Island by a sealer who had previously been a farmer.

Notwithstanding the fact that European varieties were utilised the fertile soils and favorable agricultural conditions in the vicinity of Adelaide resulted in satisfactory yields, and the area planted rapidly increased.

In 1839 500 acres were placed under crop, increasing to 1,059 in the following year and to 4,154 in 1841. There was no knowledge as to the correct time to sow and seeding varied with the individual from January to October, although the majority of colonists quickly learned that from April to May was the best period. The yields obtained were extremely good and reached as high as 40bush. per acre from a crop sown at Mount Barker in 1840.

The difficulty was that there was no flour mill in South Australia, with the result that all wheat had to be forwarded to Sydney or Hobart for grinding and then brought back as flour.

To a certain extent this retarded the expansion of the industry, but when John Ridley invented the stripper in 1842, thus reducing labor costs, the area devoted to wheat rapidly increased.

This machine provided for the removal and threshing of the ears from the standing crop and consequently allowed for the economic handling of large areas with a minimum amount of labor.

Another factor leading to additional planting was the erection of a flour mill at Hindmarsh in 1843 which provided a means of grinding flour within the colony.

The consequence was that the production exceeded the requirements of the population, and whilst there was plenty of wheat there was very little money available for the growers. As a result the South Australian Company agreed to accept grain in settlement of arrears for rent, and in that way accumulated a large stock in their stores in Adelaide. The price offering at this time, 1843, was 3s. 6d. per bushel, whilst the yield from the 13,892 acres planted in the previous year was almost double the normal requirements of the South Australian population. It was therefore necessary to find an outlet for the excess wheat. During this period the British corn duties were in operation, under which all wheat imported into England from British possessions outside Europe incurred a duty fixed on a graduated scale according to the price realised. This duty ranged from 5s. per quarter for wheat commanding 55s. per quarter to a minimum of 1s. per quarter for that realising 58s. or over.

As a consequence exporters were afraid to risk the English market, and the first shipments were forwarded to New Zealand and Mauritius. It is recorded that in 1843, 1,583bush. of wheat were consigned to New Zealand and 7,452bush. to Mauritius. In addition, 342 tons of flour were exported to the latter country with smaller quantities totalling in all 266 tons to Singapore, New South Wales, New Zealand, and Western Australia.

However, both New Zealand and Mauritius had almost their full requirements for wheat and exporting to these countries did not prove profitable. Some shipments in 1844 failed to nett more than 2s. per bushel. It was therefore decided to test the English market, and in 1845 a consignment totalling 450 quarters was shipped to that country. Immediate success was obtained, and whilst ordinary

English wheat commanded 60s. per quarter the 450 quarters from South Australia realised 76s. per quarter or more than 25 per cent. above the ruling rates.

This was the commencement of the wheat export trade to England, and from thence onwards regular shipments have been made whilst the removal of the British corn duties in 1847 still further improved the position for the export of South Australian grain. South Australia was therefore the first exporter of wheat from Australia and, in addition, for a number of years largely supplied the needs of the other States for this foodstuff. Shortly after the successful shipment to England, copper was discovered in South Australia resulting in a rapid influx of population. These two facts led to a substantial increase in the price of wheat, which rose from 2s. 6d. per bushel early in 1845 to 4s. 6d. per bushel towards the end of that year. Consequently the area under crop continued to expand, more particularly in the better type of agricultural land within reasonable distance of Adelaide. However, there were large tracts of good country covered with dense mallee scrub which on account of the cost of clearing could not be economically developed for wheat growing.

The next most notable achievement was the invention of the stump-jump plough by Mr. R. B. Smith of Ardrossan in 1876. This implement was so constructed that the bodies (each working independently) were able to rise automatically and pass over a solid obstruction without damage and then immediately re-enter the ground. Consequently, with an implement of this nature it was only necessary to axe down the timber at ground level, instead of hand-grubbing the stumps as had hitherto been the case. This meant that the huge areas of better class mallee scrub land previously referred to were now made available for economic cultivation. In later years areas situated in lower rainfall districts with poorer soils and carrying relatively stunted mallee timber were cheaply brought into production by the invention of the mallee scrub roller and mallee log. These implements were dragged over the scrub, thus breaking it down, and allowing a clean burn to be obtained. The use of stump-jjump machines then permitted seeding operations to be carried out.

Hand in hand with the extension of wheat growing followed the development of superior wheat varieties capable of producing maximum yields in the poorer soils and lighter rainfall districts in which they were to be planted and at the same time exhibiting resistance to disease, particularly red rust.

The building up of suitable varieties commenced with the selection of strains showing resistance to drought and disease, by private farmers. These strains were developed and quickly replaced the existing wheats. Later came the work of Farrer in New South Wales and the plant breeders at Roseworthy Agricultural College until to-day the whole of the varieties in cultivation are of Australian origin and have been specially evolved to meet local conditions.

Another factor in the development of the wheat industry in South Australia was the early recognition of the value of phosphatic fertilisers. The need for

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this form of manure was fully demonstrated by a series of experiments conducted by Professor J. D. Custance at Roseworthy Agricultural College from 1882 to 1885. From that time its use quickly became general, and to-day only a relatively small area of wheat is planted without the addition of superphosphate.

In the following table the development of the wheat industry in South Australia is shown:—

Period.	Acreage.	Total Yield. Bush.	Acre Yield. Bush.
1841-42	4,154	86,280	20.77
1846-47	26,135	522,680	20.00
1851-52	53,842	681,328	12.65
1856-57	162,011	4,050,275	25.00
1861-62	310,636	3,410,756	10.98
1861-65	353,600	3,957,050	11.19
1866-70	535,603	4,865,760	9.08
1871-75	795,112	7,896,867	9.93
1876-80	1,348,973	9,418,357	6.98
1881-85	1,786,783	9,975,027	5.58
1886-90	1,808,307	12,002,149	6.64
1891-95	1,558,724	8,601,036	5.52
1896-1900	1,747,773	7,060,906	4.04
1901-05	1,759,732	11,948,858	6.79
1906-10	1,826,817	21,095,664	11.55
1911-15	2,356,022	19,289,571	8.19
1916-20	2,282,990	29,322,782	12.84
1921-25	2,444,203	29,482,995	12.06
1926-30	3,396,321	28,933,487	8.52
1931-32	4,071,370	48,093,102	11.81

(The figures quoted for the quinquennial periods are annual averages.)

These figures show that in the early days of wheat growing when only the better class lands were cropped the average yields were high. As the areas extended so did the yields become lower, but from the beginning of this century, despite the extension of farming into very low rainfall districts, the yields have been improved due to the seeding of suitable varieties, the use of superphosphate, and the adoption of correct farming practices.

South Australia with its limited population has always exported a large proportion of the grain produced, and the total quantities sent overseas, together with the flour exported since 1910, are shown in the following table:—

Period	Wheat Exported. Bush.	Value. £	Flour Exported. Tons.	Value. £
1846	58,744	12,000	—	—
1851	20,080	6,000	—	—
1856	69,120	32,000	—	—
1861	674,160	196,000	—	—
1866-70	1,034,056	254,000	—	—
1871-75	2,599,411	640,000	—	—
1876-80	4,095,064	949,000	—	—
1881-85	4,678,322	939,000	—	—
1886-90	3,938,833	711,000	—	—
1891-95	4,429,132	701,000	—	—
1896-1900	1,460,626	204,000	—	—
1901-05	5,511,013	932,000	—	—
1906-10	14,732,051	2,853,000	—	—
1911-15	11,562,802	2,129,000	33,422	272,000
1916-20	16,166,911	4,211,000	63,552	805,000
1921-25	23,299,215	7,170,000	57,386	823,000
1926-30	16,592,968	4,617,000	80,104	924,000

(The figures quoted for the quinquennial periods are annual averages.)

The above figures show the value of the wheat industry to South Australia, and its importance to the financial position of the State is realised when it is noted that during the 1926-30 period a sum of over 5½ million pounds sterling was brought into the colony annually from the wheat and flour exported.

COVER CROPS OR GREEN MANURING.

[By N. R. Quinn, Assistant Horticultural Instructor.]

The term "cover crop" is rather a loose one, and it generally refers to a crop that is grown as a subsidiary crop, before, or after, a main crop, with the object of using it either for fodder or ploughing it under as "green manure." As I propose to deal with the subject purely from a horticulturist's point of view, I think that the term "green manuring" will be the best name to give to this practice.

The most important requirement of a permanent system of agriculture is the maintenance of the productivity of the soil. Under a good system of working, the soil will gradually improve in productivity and poor methods of working will, in time, deplete a soil of its former fertility and render rich soils incapable of producing other than poor crops. In orchards, crops grown for soil improvement are in nearly all cases used entirely as green manure and ploughed under at the right time.

Green Manuring at the State Experiment Orchard, Blackwood, 1932—Pease.

Green manure crops are grown primarily to improve the fertility and mechanical condition of a soil, although, in some cases a green manure crop grown on a hillside will be found to be most helpful to retard the washing of the soil during the heavy winter rains. A green manure crop will also be found very helpful in lowering the water table of a poorly drained flat, as the transpiration from a dense crop is enormous. After many years of cultivation, loam and clay loam soils lose their good physical condition with the depletion of their organic matter (decayed vegetable matter), and the soil runs together after heavy rain and its power of absorbing moisture is greatly reduced, and on drying out it sets like cement, making cultivation practically impossible until further rain has fallen. Sandy soils lose their organic matter more readily than the heavier types, owing to the sand absorbing heat and the organic matter being burnt out. A soil that is deficient in organic matter soon dries out, owing to it heating up and the moisture being driven out. Organic matter, by its light and yet bulky mass, has the tendency of insulating the soil, as well as being able to absorb large quantities of water and retaining it for a lengthy period.

It is a recognised fact nowadays that the soil is not just an inert mass, but is literally teeming with countless millions of minute organisms called bacteria, and without organic matter in a soil the work of the bacteria is greatly retarded, owing to the finer types of soils being poorly aerated. During the decomposition of vegetable matter in a soil weak acids are formed, and these acids act on the minerals, rendering them available to the roots as a plant food.

Green Manuring at the State Experiment Orchard, Blackwood, 1932—Dun Pease.

All bulky, quick-growing plants, when turned under at the right time, make good organic matter. The members of the Legume family (pod-bearing plants) are, as a rule, given preference before cereals, owing to their quick habit of growth and to the fact that they are able to collect a quantity of free nitrogen from the air, and when turned under the soil, greatly enrich it with this important plant food. Cereals return very little more nitrogen to the soil than they take from it during their growing period.

Green Manuring at the State Experiment Orchard, Blackwood, 1932—Tick Beans.

The nitrogen collected by legumes is not available to plants for about four or five weeks after ploughing under, as it has to go through two changes in the soil. The first change is into the nitrite form and then into a nitrate. These necessary changes are brought about by the bacteria referred to above. It will be seen from this fact that the ploughing under should take place well before the roots of the trees begin to move in the Spring, if they are to get the full benefit from this practice.

The area to be sown with a green manure crop should be cultivated up with the first autumn rain and the seed and manure should either be broadcasted or drilled in. Personally, I think that broadcasting is the better method of the two, for in cases where the trees have a fairly large spread, it will be found difficult to get an ordinary seed drill very close to the tree owing to the height of the wheels. After broadcasting the seed and manure, the portion sown should be harrowed lightly to cover the seed and compact the seed bed. Field peas will probably give better results in the colder districts than Tick beans, and from observations noted by the writer in the Adelaide Hills, White Brunswick peas should be given preference to the Dun pea, as the former comes into flower on approximately July 15th—at least 10 days to a fortnight before the latter. As the crop has reached maturity at the flowering stage, and this being considered the correct time to plough it under, the advantage of the early flowering White Brunswick variety should be kept in mind. The crop should always be ploughed under while there is an abundance of moisture in the soil, as moisture is required to assist the processes of decomposition. When appearances point to a dry Spring, the crop should be turned under before it reaches the flowering stage, so as to prevent the crop from robbing the trees of moisture and so doing more harm than good.

Green Manuring at the State Experiment Orchard, Blackwood, 1932—Mustard.

I would suggest that 1½bush. of seed and 2cwts. of superphosphate be sown per acre. A good dressing of lime greatly improves the growth of a legume, and if it is found that a green manure crop does not do too well the first year, and the weather conditions have been favorable, the addition of a half a ton of lime to the acre will probably show a marked improvement. The usual method of ploughing under a green manure crop is to use a single furrow plough with a disc coulter attached, so as to cut each furrow cleanly and prevent the crop from choking under the beam. If the crop is tall and dense it is a good plan to attach a drag chain to the off-side swing-bar back to the beam, leaving some slack in the chain to catch the crop and drag it into the furrow.

The results of some experiments carried out at the Government Experiment Orchard at Berri, on the River Murray, give one an idea of the amount of nitrogen contained in beans and peas. The growth above ground made by "Tick" beans 6ft. high contained 1.69 per cent. nitrogen in the dried matter, and the same variety of bean that was only half the height of the former contained 2.58 per cent. nitrogen, whilst a crop of field peas contained 2.39 per cent. From these figures it will be seen that the amount of nitrogen in a crop of legumes cannot be judged from outward appearances.

Green Manuring at the State Experiment Orchard, Blackwood, 1932—Oats.

The analysis of the roots of the beans is just the reverse of that of the tops, for the nitrogen content of the dried roots of the tallest beans contained 1.32 per cent. and the roots of the smaller beans contained only .99 per cent., and these smaller beans had made much more root growth than the former.

Green manuring is a practice that should be carried out regularly, as it takes years to build up a soil that has become deficient in organic matter. The results at first may not be outstanding, but after several years fruitgrowers will notice that their soils assume a darker color and do not dry out so quickly as before, and therefore improvements are seen in their crop returns. When these facts become apparent, the growing of green manure crops will be considered one of the most important practices of the year.

PASTURE EXPERIMENTAL PLOTS.

The pasture experimental work conducted in this State by the Dairy Council covers five main divisions, namely:—

1. Experiments planned with the object of ascertaining the most suitable pasture varieties or mixtures for any particular soil or locality.
2. The determination of the economic value of various fertilisers on pasture development.
3. An investigation into the influence of various treatments and fertilisers on the yield of non-irrigated lucerne.
4. The selection and building up of improved pasture strains with the object of ultimately harvesting and distributing seed of the superior types thus evolved.
5. The demonstration in various districts of the pasture mixture which on the evidence of previous experiments is considered likely to prove of the greatest value in that particular area.

1. PASTURE VARIETIES AND MIXTURES.

Experiments in this division were commenced in 1931, and in each year have been further extended.

The centres range from Saddleworth in the North to Mount Gambier in the South-East, and, therefore, work is in progress under various conditions of soil and climate.

The men conducting the experiments and the districts concerned are as follow:—F. Coleman, Saddleworth; W. S. McAuliffe, Eudunda; T. W. Roennfeldt, Greenock; W. T. Vigar, Eden Valley; A. E. D. Francis, Bugle Ranges; F. Keen, Meadows; D. F. Sheppard, Prospect Hill; J. A. Carruthers, Narrung; J. B. E. Wright, Meningie; J. A. Halliday, Murray Bridge; J. H. Goyder, Long Flat; A. C. Kemp, Hatherleigh; W. K. Chambers, Mount Gambier; A. Leech, Port Lincoln.

In this report it is not proposed to deal with each experiment in detail, but to discuss the results in a general way.

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For the majority of our pasture areas, Subterranean has been the outstanding clover. In those districts receiving an average rainfall of at least 20 inches and in which the early summer conditions are mild, the ordinary Mount Barker strain is the most suitable. However, the earlier ripening type introduced from Western Australia has shown great promise for areas of lesser rainfall and dryer late spring conditions. This strain has yielded good grazing and also seeded itself down satisfactorily in the plots at Saddleworth, Eudunda, Greenock, and Narrung.

White Clover has done well in the better soil and higher rainfall districts, but the long dry summers destroy many of these perennial plants, whilst lucerne flea also checks it very severely.

On the rich wet lands of Hatherleigh, Strawberry Clover is most valuable, but special conditions are necessary for the full development of this very palatable clover. Finally, amongst the clovers mention should be made of Clustered which, in the plots situated in the dryer areas, has yielded good grazing.

The best grass has been Perennial Rye Grass, but in this connection it is essential that the best type of seed should be planted. The experimental plots indicated that not only are plants raised from certified seed more leafy and have longer life than those raised from inferior strains, but are also more drought resistant. *Phalaris tuberosa* has done well, but is delicate in its early growth, and for a good stand a careful soil preparation and seeding alone are necessary.

Under lower rainfall conditions Wimmera Rye Grass is superior to any other. The only grass to which attention has been drawn in the variety tests is Cocksfoot, but those mentioned above appear far and away the most valuable under our climatic conditions.

As would be expected, the combination of these grasses and clovers according to the soil and average rainfall offering has made the best pasture mixture.

2. Fertiliser Experiments.

Two series of fertiliser experiments are in progress in which each plot is fenced, and consequently the relative grazing capacity is obtainable.

These experiments are conducted by Mr. George Cleggett at Mount Barker and Mrs. C. Milne at Meadows. In the case of the former, the pasture mixture comprises Perennial Rye Grass, White Clover, Subterranean Clover, and a little *Phalaris tuberosa*, and in the latter Perennial Rye Grass, Wimmera Rye Grass, and Subterranean Clover, together with other spontaneous herbage. The manures include superphosphate, superphosphate plus lime, and superphosphate plus sulphate of ammonia.

It is yet too early to discuss any results obtained, but on the low-lying land at Meadows liming has led to improvement, whilst the evidence from various demonstrations conducted on other plots is that sulphate of ammonia promotes considerably increased growth of fodder, but whether such applications are economic has still to be proved.

3. Manuring and Treatment of Lucerne.

In certain parts of the State extensive areas of lucerne are planted without irrigation. In the Lakes district experiments are being conducted on the properties of Messrs. J. A. Carruthers, Narrung, and J. B. E. Wright, Meningie, to ascertain the best treatment for this crop. The tests include the effect of varying quantities of superphosphate, the seeding of a winter growing pasture (Wimmera Rye Grass), and the cultivation of the lucerne during the winter months.

The plots are not fenced and therefore unless the crop should happen to be cut and carted the benefit from any treatment is simply a matter of observation.

No results have been obtained from Meningie, as it was first necessary to establish an even stand of lucerne, but at Narrung winter tillage which on the sandy soil was carried out by means of harrows has brought about a much better growth of lucerne than any other treatment.

4. Pasture Seed Farm.

The work of establishing a pasture seed area at the Kybybolite Experimental Farm was commenced last year.

Strains of Perennial Rye Grass, Cocksfoot, Brown Top, *Phalaris tuberosa, Danthonia,* White Clover, Subterranean Clover, and Montgomery Red Clover were obtained from various sources in Australia and New Zealand. These were planted in small plots, and it will be necessary to select the most promising individual plants from which to harvest seed for future planting. Eventually it is hoped to evolve special strains well suited to South Australian climatic conditions, and by harvesting and distributing seed from these types improve the character of varieties seeded in local pastures. It can readily be understood that this requires much time and careful observation, and the work is now at a stage when the selection of suitable individual plants is in progress. In order to render further assistance, the Council has agreed to pay the wages of a cadet who would make a close study of the various strains, and in that way co-operate with the Manager (Mr. L. J. Cook) in isolating the most valuable types.

A report supplied by Mr. Cook is as under:—

The majority of the strains of grasses sown in 1932 germinated and established themselves well, and made good spring and early summer growth. The plots were kept well grazed by sheep at various periods during September, October, November, and January and early February of 1933. Comparatively complete grazing was maintained to check undue growth of annual weeds, and to strengthen roots of perennials.

Short rows were hand-hoed, and left ungrazed during the main growing period, so that each strain could be better examined for mixed and poor types. Amongst the Perennial Rye Grasses, some of the uncertified strains were noticed to contain quite a percentage of annual and biennial types, the bulk of which did not persist throughout the first summer. The strains of Perennial Grasses have withstood their first summer very well but the White Dutch Clover species failed to live through.

The summer rainfall received was below the average, but the death of Perennial grasses was negligible. Useful falls of rain in January and March enabled these species to live healthily and maintain some growth.

Notes on the growths of the various species were taken at six individual and indiscriminate metres of each, in mid April, and recorded for future use in selecting the better strains. This autumn growth can be looked upon as very satisfactory, and should prove a helpful guidance in the future, particularly in regard to the Perennial Rye Grasses, there being quite a marked difference in the size of plants, numbers of tillers, and habit of growth, although the length of leaf growth in the different species did not show much variation. The autumn growths of *Phalaris tuberosa* strains were not equal in volume to those of the Perennial Rye Grasses, but nevertheless the plants maintained good health, and made satisfactory development.

During the latter half of April and autumn growth was grazed from the plots, and on May 2nd all of the sown areas were top-dressed with 45 per cent. superphosphate at the rate of 1cwt. per acre. Late in May further observations and percentage readings of the growths of species were taken, and they were then again grazed by sheep during early June.

A careful examination and recording of plants will be made during July, particularly as regards their health under mid winter conditions, and of their ability to produce feed at this, the lean period of the season. Also it is hoped to make a definite start on selective work, and outstanding winter feed producing plants will be marked for closer observation during their future life. This season several additional strains of Perennial Rye Grasses have been sown alongside the 1932 series. Also small trial plots of seven strains of Wimmera or Annual Rye Grass, 10 Clover strains, and 22 species of introduced grasses have been sown. The trial of *Danthonia* species made last season failed, but the Waite Research Institute have kindly supplied seed of two of the best strains again this season, and these have been included in the series.

The condition of the plots at present is good, the Subterranean Clover sown over half the area of grasses last season has germinated well this season, and is making good growth. Cape Weed is somewhat plentiful where Perennial plants have failed to establish but otherwise weeds are well under control.

5. Pasture Demonstration Plots.

This season it was decided to utilise the information gained from previous experiments and establish demonstration plots in various districts. These plots would be planted with the mixtures considered most suitable according to the conditions offering and would serve as illustrations for those men possessing similar land.

The fields utilised were up to six acres in area, and the men selected to carry out the work were Messrs. J. Fisher, Gladstone; W. P. Eckermann, Eudunda; C. M. Watson, Mount Pleasant; L. Hampton, Echunga; A. T. Jefferis, Willunga; R. C. West, Myponga; A. C. Kemp, Hatherleigh; H. Walsh, Mount Barker (irrigated pasture). With the exception of the plot to be irrigated, all fields have been planted and a satisfactory germination obtained.

DRY BIBLE (BOTULISM).

"Is there any known preventive for paralysis of the throat in cattle, which we believe to be a symptom of dry bible?"

Mr. R. H. F. Macindoe, B.V.Sc., M.R.C.V.S. (Deputy Chief Inspector of Stock), supplies the following reply to the foregoing question, which was asked by the Allandale East Branch of the Agricultural Bureau.

The disease popularly known as dry bible is not a disease of the third division of a cow's stomach (the psalterium or bible), as was at one time thought, but the term is applied to indicate a disease of cattle, the characteristic symptom of which is a loss of function of certain muscle groups indicated—according to what muscles are affected—by symptoms of paralysis such as paralysis of the throat, in which case the animal cannot swallow and there is interference with tongue movement, paralysis of hindquarters, when animal is unable to rise from the ground, and sometimes there may be paralysis of the bowels.

The paralysis is due to injury of the nerves or nerve endings, brought about by the animal swallowing the toxin (poison) of a germ known as the *Botulinus bacillus,* which is frequently present in decaying or old bones and damaged fodder.

In cattle the disease most frequently occurs through their chewing bones, more rarely through eating damaged fodder, and this bone chewing is the direct result of a deficiency of phosphates in the animal's food, whether pasture or conserved fodder.

As a result of its craving for phosphates (which are essential to the animal's health and wellbeing, especially growing animals and those producing milk), the animal develops a depraved appetite, and will chew bark, wood, leather, bones, &c., seeking to appease the craving.

Bones are rich in phosphates, but are dangerous unless they have been thoroughly heated and dried in order to kill the germ and poisons which may be present in them.

Dry bible (*botulism*) can be prevented by providing cattle with mineral mixtures containing phosphates either in the form of licks, which are placed in receptacles protected from the weather, to which the cattle can have ready access at any time, or feeding the mixture to the cattle in their food. Any of the following mixtures are suitable, they being recommended in the order given:—

1. Sweet bonemeal and common salt, equal parts. Thoroughly mixed.
2. Di calcic phosphate, 40 parts; common salt, 60 parts. Thoroughly mixed.
3. Ground rock phosphpate and common salt, equal parts. Thoroughly mixed.
4. Superphosphate and common salt, equal parts. Thoroughly mixed.

Many cattle will refuse to eat the mixtures at first, but they may be induced to do so by mixing it with a little molasses, treacle, or ground grain and making them more palatable.

If the mixture is to be given in the food, 1oz. to 2ozs. should be given twice a day, and an approximate guide for the amount to be fed can be based on supplying 1oz. for each gallon of milk produced. In the case of known bone-chewers, give them as much as they will consume, and at the end of 4-6 weeks it will be noted that they cease to crave for bones. They can then be placed upon a smaller amount.

All old bones and dead carcasses should be burnt or buried deeply.

ARGENTINE GRAIN TRADE.

[Extracts from a Report (dated May 2nd) by the Argentine correspondent of the Empire Marketing Board in relation to the Argentine Grain Trade during April.]

WHEAT.

Exports.—The quantity of wheat exported from the Republic during the month of April was 470,000 tons, which compares with 479,451 exported during the previous month and 478,111 tons in February.

The statistical position of the wheat crop is now as follows:—

	Tons.
Second official estimate of the 1932-33 crop	6,405,993
Carry-over from 1931-32	300,559
Total	6,706,552
Required for seed and domestic consumption	2,600,000
Balance available for export	4,106,552
Exported to April 30th	1,802,686
Still available for export	2,303,866

Markets.—More activity has characterised the markets during the month, especially during the latter half. The United Kingdom has shown more interest in Plate wheats and has purchased fair quantities. Rightly or wrongly, the opinion is held that the embargo placed by Great Britain on imports from Russia will lead to more business being done here by the British millers, who it is thought will substitute Argentine wheats for those which might have been bought in Russia.

China has again been in the market for Argentine wheat, and some sales have been put through. Amongst the steamers chartered during the past week, four 7,500-ton boats for Shanghai are listed. Our neighbors, Brazil, Chile, and Uruguay, have all been buyers of fair quantities of wheat during the month.

In the domestic market also there has been fair activity, and the millers have been as usual willing buyers of parcels of good quality grain, and even less desirable parcels have been much easier to place than had formerly been the case.

Needless to say, there has been some development of speculative interest, following the increased activity in the market and the consequent advance in prices. This advance, however, has not been in the least comparable to those in other markets, such as Chicago and Winnipeg.

Whilst the improvement in price levels has brought some increase in the offers to sell at country points, these have not been sufficient to create any selling pressure. Generally speaking, the farmer in need of cash with which to carry on his operations inclines now to market his early maize rather than what he has left of his wheat, as even with maize prices down a little and wheat prices up a little, he still has a better margin over costs of production on his maize than on his wheat, whilst in addition maize is more likely to deteriorate in storage than is wheat. Barring the development of abnormal conditions, the pressure of Argentine wheat on the markets of the world may be regarded as over for this season.

A New Wheat.—A sale of unusual interest was effected a few days ago, when a parcel of 75,000 bags (about 5,000 metric tons, or 183,500bush.) of Black Hull wheat was purchased by a certain shipper from a grower in the Tres Arroyos district at a price of $6.40 paper pesos the quintal (say, 55 cents Canadian per bushel), nearly 25 per cent. above the current market for ordinary wheat. It is understood that a somewhat smaller parcel of the same wheat was also purchased at the same time at a slightly lower price.

This is a new variety of wheat in this country. It is said to be a type which combines the characteristics of the well-known Argentine Barletta and Kanred (Kansas Red). According to press reports, experts have declared this new wheat to be superior to Manitoba No. 1. It is said to be well adapted for growing in the Tres Arroyos district of the south of the province of Buenos Aires, where during the last two or three years the best Argentine wheats have been produced.

BARLEY.

During the month of April 58,150 metric tons have been exported, leaving the statistical position as follows:—

	Tons.
Second official estimate, 1932-33 crop	700,000
Seed and domestic requirements	143,000
Balance available for export	557,000
Exported to April 30th	255,171
Still available for export	301,829

Market conditions during the month have shown some improvement over those of the previous month, and the better demand has raised prices a little. The closing price for Feed Barley was $4.20 paper pesos the quintal, equal to 28¾ cents Canadian per bushel at the prevailing rate of exchange, delivered in the port. Brewing Barley is worth a little more than this.

OATS.

38,196 metric tons of Oats were shipped from Argentine ports during the month of April, against 70,663 tons in the preceding month.

Statistically, the situation is now as follows:—

	Tons.
Second official estimate of the crop	1,010,000
Seed and domestic requirements	460,000
Balance available for export	550,000
Exported to April 30th	236,859
Balance still available	313,141

MARE WITH GROWTH IN EYE.

The Deputy Chief Inspector of Stock (Mr. R. H. F. Macindoe, B.V.Sc., M.R.C.V.S.), in reply to a question from the Shoal Bay Branch of the Agricultural Bureau as to the best treatment for a mare witth a pinkish colored growth in the eye which was first noticed three years ago, says the symptoms described suggest that the cause is a tumor (epithelioma) on the "haw" or third eyelid, which is situated on the lower corner of the eye, and this third eyelid is used by the horse to keep the eye free of dust, &c. By pressing with the first finger and thumb of one hand, the eyelids of the affected eye towards the lower corner of the "haw" can be projected, and if healthy will be found to have a smooth pink surface. If a tumor is present, the haw will show a raised red area and the tumor may be large enough to project over the eye. The only effective treatment is to remove the growth by surgery; treatment by eye lotions is useless.

The operation can be carried out simply and painlessly if the following directions are followed:—Place a few drops of a solution of cocaine (5 per cent. strength), which the doctor may possibly supply, in the affected eye. Five minutes after the "haw" should be projected and pierced by a needle and silk, then drawn out gently and the cocaine solution injected all around the growth with a hypodermic syringe. Allow five minutes for the solution to deaden the part and then remove the growth by cutting through the tissue well away from the growth, using a pair of curved scissors. After removal, bathe the eye with strong boracic acid solution. Healing will take place in three to four days. The operation can be performed with animal standing, but the nose should be held in a twitch stick.

RED COMB EGG ASSOCIATION.

OFFICIAL SINGLE TEST.

EGG-LAYING COMPETITION, 1933-34.

Section 1.—White Leghorns.

Competitor.	Address.	Score to Month ending June 30th, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
E. F. Ashmeade	398, Magill Road, Kensington Park	(1) 12	(2) 13	(3) 33	58
L. R. Badcock	77, Findon Rd., Woodville	(4) 9	(5) 36	(6) 24	69
C. J. C. Burton	Mallala	(7) 18	(8) 18	(9) 29	65
C. J. C. Burton	Mallala	(10) 18	(11) 9	(12) 31	58
W. A. Carter	2, Grosvenor St., Glandore	(13) 17	(14) 34	(15) 1	52
W. A. Carter	2, Grosvenor St., Glandore	(16) 29	(17) 33	(18) 4	66
B. Cooke	Kanmantoo	(19) 42	(20) 32	(21) 18	92
H. F. Cox	Samson Road, Glanville Blocks	(22) 10	(23) 28	(24) 15	53
H. F. Cox	Samson Road, Glanville Blocks	(25) 21	(26) 35	(27) 33	89
L. H. Crawford	Military Road, Grange ..	(28) 19	(29) 30	(30) 29	78
L. H. Crawford	Military Road, Grange ..	(31) 30	(32) 3	(33) 21	54
R. C. Crittenden	William Street, Kilkenny North	(34) 42	(35) 36	(36) 26	104
Chas. H. Day	Box 28, Salisbury	(37) 14	(38) 6	(39) 23	43
J. H. Dowling	Glossop	(40) 30	(41) 21	(42) 21	72
T. Duhring	Mallala	(43) 30	(44) 31	(45) 8	69
T. Duhring	Mallala	(46) 5	(47) 2	(48) 6	13
H. Fidge	313, Cross Roads, Clarence Park	(49) 17	(50) 14	(51) 11	42
V. F. Gameau	Findon Road, Woodville .	(52) 1	(53) 20	(54) 23	44
W. Chas. Slape	Magill Road, Magill	(55) 7	(56) 41	(57) 24	72
G. C. Gavin	Salisbury	(58) 18	(59) 11	(60) 19	48
G. C. Gavin	Salisbury	(61) 28	(62) 28	(63) 24	80
H. H. Hefford	McHenry Street, Murray Bridge	(64) 21	(65) 15	(66) 8	44
H. H. Hefford	McHenry Street, Murray Bridge	(67) 50	(68) 22	(69) 8	80
W. H. A. Hodgson ..	Commercial Rd , Salisbury	(70) 19	(71) 18	(72) 9	46
W. H. A. Hodgson ..	Commercial Rd., Salisbury	(73) 16	(74) 17	(75) 10	43
E. A. Lamerton	Cross Roads, Edwardstown	(76) 3	(77) 23	(78) 38	64
C. H. Lines, jun. ...	Box 75, Gladstone	(79) 29	(80) 40	(81) 4	73
C. H. Lines, jun. ...	Box 75, Gladstone	(82) 28	(83) 13	(84) 27	68
V. F. Gameau	Findon Road, Woodville .	(85) 13	(86) 14	(87) 17	44
L. A. G. Pitt	24, John Street, Payneham	(88) 21	(89) 11	(90) 13	45
L. A. G. Pitt	24, John Street, Payneham	(91) 31	(92) 23	(93) 23	77
H. A. Rasmussen ...	Swan Terrace, Ethelton .	(94) 17	(95) 32	(96) 43	92
H. A. Rasmussen ...	Swan Terrace, Ethelton .	(97) 24	(98) 26	(99) 27	77
S. E. Reedman	51, Gilbert Street, Gilberton	(100) 31	(101) 41	(102) 25	97
Bruce Rowe	"St. Kevern," Two Wells	(103) 23	(104) 8	(105) 43	74
Bruce Rowe	"St. Kevern," Two Wells	(106) 22	(107) 18	(108) 9	49
H. J. Stacey	Uraidla	(109) 19	(110) 13	(111) 16	48
H. J. Stacey	Uraidla	(112) 26	(113) 27	(114) 3	56
Thomas & Elson ...	53, Clifton Street, Hawthorn	(115) 18	(116) 11	(117) 26	55
Thomas & Elson ...	53, Clifton Street, Hawthorn	(118) 12	(119) 6	(120) 19	37
H. L. Twartz	Gawler	(121) 27	(122) 26	(123) 36	89
H. L. Twartz	Gawler	(124) 19	(125) 11	(126) 27	57
F. F. Welford	1, Ludgate Circus, Colonel Light Gardens	(127) 24	(128) 49	(129) 23	96
F. F. Welford	1, Ludgate Circus, Colonel Light Gardens	(130) 40	(131) 22	(132) 9	71

EGG-LAYING COMPETITION—SECTION 1—WHITE LEGHORNS—*continued.*

Competitor.	Address.	Score to Month ending June 30th, 1933.			
		Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Bird No. and Eggs Laid.	Totals
A. P. Urlwin	Box 80, Balaklava	(133) 2	(134) 35	(135) 28	65
A. W. Dawes	230, Portrush Road, Glenunga Gardens	(136) 45	(137) 22	(138) 27	94
Total—Section 1		—	—	—	2,962
SECTION 2—ANY OTHER LIGHT BREEDS.					
V. F. Gameau	Findon Road, Woodville (Minorcas)	(139) 24	(140) 13	(141) 5	47
M. O. and C. A. Roberts	Torrens Road, Kilkenny (Minorcas)	(142) 2	(143) 23	(144) —	25
Total—Section 2		—	—	—	67
SECTION 3—BLACK ORPINGTONS.					
Arthur Cook	187, Goodwood Road, Colonel Light Gardens	(145) 36	(146) 50	(147) 19	105
B. Cooke	Kanmantoo	(148) 31	(149) 9	(150) 32	72
L. H. Crawford	Military Road, Grange	(151) 6	(152) 2	(153) 17	25
L. H. Crawford	Military Road, Grange	(154) 25	(155) 28	(156) 51	104
Les. Darcy	Mypolonga	(157) 36	(158) 29	(159) 23	88
Les. Darcy	Mypolonga	(160) 13	(161) 33	(162) 25	71
J. H. Dowling	Glossop	(163) 8	(164) 5	(165) —	13
H. Fidge	313, Cross Rds., Clarence Pk.	(166) 26	(167) 36	(168) —	62
H. H. Hefford	McHenry Street, Murray Bridge	(169) 17	(170) 8	(171) 36	61
F. J. Hudson	54, Willcox Av., Prospect	(172) 34	(173) 49	(174) 20	103
A. G. Dawes	230, Portrush Road, Glenunga Gardens	(175) 21	(176) 54	(177) 16	91
C. H. Lines, jun.	Box 75, Gladstone	(178) 21	(179) 4	(180) 3	28
C. H. Lines, jun.	Box 75, Gladstone	(181) 22	(182) 3	(183) 34	59
H. J. Mills	Edward St., Edwardstown	(184) 30	(185) 47	(186) 42	119
H. J. Mills	Edward St., Edwardstown	(187) 44	(188) 26	(189) 21	91
J. Rawe	Honeyton St., Seaton Pk.	(190) 43	(191) 15	(192) —	58
S. E. Reedman	51, Gilbert St., Gilberton.	(193) 28	(194) 21	(195) 53	102
S. E. Reedman	51, Gilbert St., Gilberton.	(196) 3	(197) 35	(198) 43	81
H. L. Twartz	Gawler	(199) 30	(200) 47	(201) 28	105
A. G. Dawes	230, Portrush Road, Glenunga Gardens	(202) 41	(203) 53	(204) 42	136
N. F. Richardson	60, Beaufort St., Woodville Park, Kilkenny	(205) 51	(206) 35	(207) 42	128
W. H. L. Wittenberg	3, Rushton St., Goodwood	(208) 52	(209) 14	(210) 15	81
W. H. L. Wittenberg	3, Rushton St., Goodwood	(211) 8	(212) 53	(213) 46	107
W. Woodley	Tailem Bend	(214) 8	(215) 1	(216) —	9
W. Woodley	Tailem Bend	(217) 11	(218) —	(219) 4	15
Total—Section 3		—	—	—	1,914
SECTION 4—ANY OTHER HEAVY BREED.					
H. Fidge	313, Cross Roads, Clarence Park (Rhode Is. Reds)	(220) 5	(221) 6	(222) —	11
V. F. Gameau	Findon Road, Woodville (Rhode Island Reds)	(223) 19	(224) 12	(225) 19	50
V. F. Gameau	Findon Road, Woodville (Rhode Island Reds)	(226) —	(227) 16	(228) 31	47
H. J. Mills	Edward St., Edwardstown (Rhode Island Reds)	(229) 40	(230) 35	(231) 25	100
W. R. Williams	28, Avenue Rd., Frewville (Rhode Island Reds)	(232) 37	(233) 38	(234) 22	97
W. R. Williams	28, Avenue Rd., Frewville (Rhode Island Reds)	(235) 24	(236) 17	(237) 44	85
Bruce Rowe	"St. Kevern," Two Wells (Barnevelders)	(238) 11	(239) —	(240) —	11
Bruce Rowe	"St. Kevern," Two Wells (Welsumers)	(241) 3	(242) 2	(243) —	5
Total—Section 4		—	—	—	406

RED COMB EGG ASSOCIATION.

OFFICIAL EGG-LAYING COMPETITION, 1933-34.

Conducted at the Parfield Poultry Station under the supervision of the Department of Agriculture.

LEADING SCORES TO WEEK ENDED JUNE 30TH.—*FIRST GRADE EGGS ONLY.*

WHITE LEGHORNS.

	Eggs Laid.	Bird Nos.
Singles—		
H. H. Hefford	50	67
F. F. Welford	49	128
A. G. Dawes	45	136
Trios—		
R. C. Crittenden	104	34—36
S. E. Reedman	97	100—102
F. F. Welford	96	127—129
Teams—		
H. A. Rassmussen	169	94—99
F. F. Welford	167	127—132
H. L. Twartz	146	121—126

MINORCAS.

	Eggs Laid.	Bird Nos.
Singles—		
V. F. Gameau	24	139
M. O. & C. A. Roberts	23	143

BLACK ORPINGTONS.

	Eggs Laid.	Bird Nos.
Singles—		
A. G. Dawes	54	176
W. H. L. Wittenburg	53	212
A. G. Dawes	53	203
S. E. Reedman	53	195
Trios—		
A. G. Dawes	136	202—204
N. F. Richardson	128	205—207
H. J. Mills	119	184—186
Teams—		
A. G. Dawes	227	175—177 & 202—204
H. J. Mills	210	184—189
W. H. L. Wittenburg	188	208—213
S. E. Reedman	183	193—198

ANY OTHER HEAVY BREED.

Rhode Island Reds.

	Eggs Laid.	Bird Nos.
Singles—		
W. R. Williams	44	237
H. J. Mills	40	229
Trios—		
H. J. Mills	100	229—231
W. R. Williams	97	232—234
W. R. Wililams	85	235—237
Teams—		
W. R. Williams	182	232—237
V. F Gameau	97	223—228

THE HILLS HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MAY, 1933.

Herd No.	Average No. of Cows in Herd,	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during May.	Per Cow during May.	Per Cow July to May.	Per Herd during May.	Per Cow during May.	Per Cow July to May.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
7/E .	27	21·23	11,246	416·52	6,178·89	456·87	16·92	250·22	4·06
7/H .	9	7·58	5,543½	615·94	6,440·41	259·64	28·85	321·98	4·68
7/K .	16·94	13·94	11,651½	687·81	7,855·25	456·85	26·97	322·07	3·92
7/L .	35·94	24·52	15,651	435·47	6,291·85	765·73	21·31	297·62	4·89
7/T .	14·68	11·35	4,511½	307·32	4,996·33	220·84	15·04	231·05	4·89
7/W .	19	15·06	8,437	444·05	6,737·47	365·51	19·24	282·87	4·33
7/Y .	27	14·61	7,285½	269·83	5,855·09	361·37	13·38	274·75	4·96
7/Aa.	14	7·84	2,975	212·50	4,924·21	158·08	11·29	242·76	5·31
7/Hh.	18	12·71	6,562	364·56	5,366·96	292·40	16·24	234·67	4·46
7/Kk	19·39	13·26	8,404	433·42	6,742·15	377·83	19·49	287·20	4·50
7/Mm.	37·55	30·90	14,958	398·35	7,087·80	597·88	15·92	278·27	4·00
7/Nn.	24	15·61	7,254½	320·27	6,337·20	282·12	11·76	249·46	3·89
7/Oo.	16·	13·29	9,276½	579·78	6,954·86	438·79	27·42	231·14	4·73
7/Pp.	19	16·32	9,325½	490·82	6,739·83	499·48	26·29	363·65	5·36
7/Qq.	17	15·81	8,413½	494·91	5,467·60	493·86	29·05	309·58	5·87
7/Tt .	19·74	19·32	11,618	588·55	6,951·37	547·87	27·75	312·75	4·72
7/Uu.	24	14·94	6,039	251·66	5,304·65	303·94	12·66	243·44	5·03
7/Vv.	14	10·16	6,885	491·78	6,897·96	343·24	24·52	340·25	4·99
7/Xx.	22	16·90	11,439	519·95	7,560·31	593·69	26·99	413·27	5·19
7/Yy.	22	20	8,044½	365·66	5,195·92	372·56	16·93	233·99	4·63
7/P .	23·13	15·87	15,091½	599·88	April-May 958·66	745·66	29·82	April-May 46·34	4·94
Means	20·95	15·77	9,076·76	433·83	6,253·93	425·44	20·33	285·16	4·69

NARRUNG HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MAY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during May.	Per Cow during May.	Per Cow October to May.	Per Herd during May.	Per Cow during May.	Per Cow October to May.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
5/C ..	35·06	27·32	15,101½	430·73	4,247·88	775·68	22·12	219·10	5·14
5/D .	29·61	17·42	12,516	422·69	4,079·73	671·16	22·67	221·91	5·36
5/E .	41	29·23	17,635½	430·88	3,542·09	906·69	22·15	188·91	5·17
5/P .	32	27·55	19,697	615·53	4,612·28	1,044·59	32·64	231·94	5·30
5/R .	69·23	31·94	7,558½	109·20	2,435·78	364·99	5·27	102·29	4·88
5/S ..	18	13·81	6,903½	383·53	2,923·37	336·09	18·67	143·28	4·87
5/Y .	26	22·68	15,841½	609·29	4,252·18	904·24	34·78	226·58	5·66
5/Z ..	36·94	35·19	26,151½	707·94	5,309·19	1,324·56	35·86	257·79	5·06
5/Ee	19	10·13	3,052	160·63	4,786·05	178·44	9·39	242·66	5·85
5/Gg	22·06	16·58	5,118	232·00	2,744·89	257·36	11·67	132·81	5·03
5/Ii .	31	24·77	13,386½	431·82	4,347·75	693·01	22·36	218·03	5·23
5/Jj .	23·61	13·39	10,600½	448·98	4,191·77	453·23	19·20	183·63	4·27
5/Kk	20·71	18·23	8,031½	387·80	3,669·58	387·98	18·73	168·21	4·83
5/Nn.	27	12·06	5,626	208·37	4,268·28	262·02	9·70	201·01	4·66
5/Oo	20·94	13·74	5,150	245·94	3,972·67	238·63	11·40	181·50	4·63
5/Qq	21	15·74	9,639	459·00	3,707·25	536·30	25·54	204·74	5·56
5/Rr	23	21	8,416½	365·93	2,561·81	454·10	19·74	143·16	5·39
5/Ss .	21·48	11·13	4,078	189·85	3,562·90	204·88	9·54	166·02	5·02
5/Tt	11·23	9·77	4,761½	423·98	4,394·44	256·18	22·81	228·63	5·38
5/Uu.	22·03	19·94	7,619	345·84	3,313·54	340·84	15·47	150·23	4·47
5/Vv	28	27·97	24,889	881·95	4,754·35	993·62	35·19	205·99	3·99
Means	27·57	19·98	11,036·79	400·37	3,812·70	551·65	20·01	187·01	5·00

LAKE ALBERT HERD TESTING ASSOCIATION.

RESULTS OF BUTTERFAT TESTS FOR MAY, 1933.

Herd No.	Average No. of Cows in Herd.	Average No. of Cows in Milk.	Milk.			Butterfat.			Average Test.
			Per Herd during May.	Per Cow during May.	Per Cow December to May.	Per Herd during May.	Per Cow during May.	Per Cow December to May.	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	%
6/B ..	19	11·45	6,522	343·26	1,928·88	300·38	15·81	91·11	4·61
6/C ..	20	15·35	12,466½	623·33	3,245·19	508·30	25·42	145·26	4·08
6/F .	22·03	14·58	14,368	652·20	3,162·79	685·98	31·14	159·67	4·77
6/H .	26	18·52	16,409	631·11	2,859·28	744·05	28·62	139·76	4·53
6/Y .	12·23	8·26	2,496½	204·12	2,398·27	110·83	9·06	107·36	4·44
6/Ii .	29·19	26·61	17,296½	592·55	3,826·16	736·63	25·24	163·57	4·26
6/Ll .	24·90	19·87	11,557½	464·16	3,430·59	426·87	17·14	132·55	3·69
6/Oo	20·87	19·87	14,150	678·00	5,070·58	636·67	30·51	227·38	4·50
6/Pp	15	14·77	9,492½	632·83	3,140·40	527·73	35·18	158·78	5·56
6/Qq	24	17·03	10,321	416·01	4,632·17	456·63	18·45	199·81	4·42
6/Rr	29	18·81	11,624	400·83	4,125·94	500·69	17·27	178·00	4·31
6/Tt	21·61	18·71	11,359½	525·65	3,781·51	505·56	23·39	168·53	4·45
6/Vv	21·68	14·97	11,737	541·37	4,123·03	567·68	26·18	195·13	4·84
6/Xx	24·81	21·74	13,300½	536·09	4,027·03	590·23	23·79	171·68	4·44
6/Yy.	30·55	24·61	12,904½	422·40	2,688·15	698·35	22·86	138·13	5·41
6/Zz .	27	19·77	12,375½	458·35	4,001·21	609·08	22·56	180·80	4·92
6/Aaa	21	4·16	3,042	144·86	1,144·85	157·23	7·49	63·28	5·17
6/Bbb	28·58	23·29	15,910	556·68	4,221·24	649·43	22·72	171·36	4·08
6/Ccc	21·65	19·42	9,560	441·57	3,686·93	401·07	18·53	155·64	4·20
6/Ddd	24	20·68	12,207½	508·64	3,977·49	535·61	22·32	173·87	4·39
6/Eee	27·58	22·48	16,890	612·40	4,740·48	729·85	26·46	200·56	4·32
6/Fff	26·35	22·94	14,978	568·42	4,422·77	693·23	26·31	188·42	4·63
6/Ggg	25·35	24·68	17,803½	702·31	5,053·11	698·90	27·57	202·29	3·93
Means	23·58	18·37	12,120·50	513·98	3,681·08	542·22	22·99	163·00	4·47

ORCHARD NOTES FOR SOUTHERN DISTRICTS, JULY, 1933.

[By Chas. H. Beaumont, District Horticultural Instructor, &c.]

June was a splendid month for pruning, so that there should not be very much left; but every effort should be made to complete the work. Do not neglect to paint the big cuts; much of the disease in orchards is due to neglect of this precaution. Especially take away any broken or hollow limbs which may be a harbor for codlin larvae. Hollows which cannot be cut away may be scraped out and the hollow filled with concrete, care being taken to prevent lodgments for water. Scrape off all loose bark and clean out the crutches of limbs. Burn all cuttings as early as possible and dispose of all refuse fruit. Spray trees subject to fungus diseases with a winter strength of bordeaux, or with a solution of bluestone, 1lb. in 10galls. of water; wash out the pump and hose after using this solution. Vines need the same treatment as the fruit trees at this time, giving special care to vines which have been affected by anthracnose or black spot; the mixture for swabbing vines will be supplied on application.

Planting will have finished; newspaper rolled around the stems will help to prevent frost damage. Young trees must be protected from hares and rabbits; there is only one sure way, and that is a good netting fence.

Tomato houses should be kept free from weeds, inside and outside. Watch for cutworms, which work at night, and use a little arsenate of lead dust if noticed.

Keep strawberry beds free of weeds and stagnant water.

Spray outfits should be in good order.

Pen up all drying sheds and racks, so that birds may eat the refuse. Do not leave any bits of dried grapes or fruit about. The fruit moth will take hold of any refuse left in the sheds.

Be ready to deal with storm waters.

PAPERS READ AT CONFERENCES.

[*River Murray Branches, Berri, June 15th*, 1933.]

SULTANA GROWING FOR QUALITY.

[By L. A. CHAPPLE, Berri.]

This undoubtedly means sultana growing for profit. The question then arises, how close is it possible to plant to obtain maximum results? This, again, will depend on how much care and feed are expended on the vines. More fruit can be taken off the acre of vines planted 11ft. between rows and 7ft. in the row than can be taken off vines planted 12ft. x 10ft., or 12ft. x 8ft. I would advise planting 11ft. x 7ft., or 11ft. x 8ft. Planting can be done during the winter months, or by "watering in" during an irrigation in spring. Usually vines are put on the trellis after the first year's growth. The trellis on which a sultana vine is trained is an important factor in sultana growing.

THE TRELLIS.

Posts should be cut 5ft. 9in. long, strainers 7ft., and posts about 20in. in the ground. The strainers should have a lean backwards and be strutted 20in. from the ground with a strut 7ft. long. A good, stout footpiece is necessary, and this should be 20in. long and be allowed to show 4in. above the ground, so that it can be seen and not knocked out with the plough or horse hoe. Box gum posts are the best, but other timbers may be used, even mallee, some of which are really good. The wires should not be put through the post, but the holes bored across the row, the wire then run out alongside the post and strained. After this a handy length of wire is taken and the wires fastened to the posts. This is done by pushing the wire through the post, bending back the end to form a short staple securing the wire by being tapped back into the hole, just sufficiently tight to allow the wire to be strained again if need be. The long end is then brought round the post, bent over the wire, and cut off. This method of trellising allows for a post to be replaced at any time with little trouble. The trellis should be of three wires. The vine to be crowned on the centre one. The centre wire should be 2ft. 9in. from the ground, the bottom wire 8in. below it, and the top wire 10in. above it.

Although the sultana will do moderately well in a variety of soils, probably the best fruit is grown in deep sandy soil. Fruit off this type of soil ripens early, and can be depended on for a good color when dried. Although the sultana vine stands up to a fair amount of salt, good drainage is necessary to get the best results.

PRUNING.

Good pruning is necessary to produce good average crops of quality. The first year's pruning varies somewhat. Vines that have not made strong growth should be cut back to two buds, cutting through the third bud. A piece of binder twine is tied to this dead end and made fast to the wire of the trellis, and a shoot trained up this. As soon as the shoot reaches the wire, the tip should be pinched out and two shoots trained along the centre wire, all side shoots being rubbed off. The second year's pruning on this type of vine will be to form two short arms, thus forming the vine for future work. This method will give good straight stems and a well-formed vine. But, should the young vine have made exceptional growth before the trellis is put up, or in the case of grafts, which have not been attended to in the manner just mentioned, a different method should be used. If only moderate growth has been made, the cane can be trimmed and tied to the centre wire, the top bud being cut through to prevent the tie slipping off. All side shoots are rubbed off, and the two shoots at the top are trained along the wire, tipped when about a foot long, and secured to the wire, thus forming the vine for future pruning. If the growth has been exceptional, neither of these methods should be followed, because there is too much danger of shoots being blown off. The cane should be trimmed long enough to be bent sharply over the centre wire down to the bottom wire and securely tied. This method applies particularly to grafts. If the vine has been formed on the "Espalier system" the second year's pruning will consist of selecting the number of canes that will balance the vine, the canes being cut to about 12 buds. Care must be taken that the weaker side of the vines carries less canes than the stronger. No spurs are left at this age, but in twisting on, the canes nearest the stem of the vine should be the first twisted on, bent down carefully and twisted on the bottom wire. The next cane is then taken and treated the same way. If there is a third cane it can be twisted on the centre wire. In older vines that have made strong growth there may be more than three canes left on either side of the stem. Where this is the case, the first three, at least, should be bent down and twisted on the bottom wire, the remainder being twisted on the centre wire, leaving the top wire to carry the foliage only. Not only does depressing the cane to the bottom wire tend to make it bear better, but the sharp bends given to the canes bring the base buds more prominent at a position where the growth from them can be best used for the following year's fruiting wood.

Probably the most important point in pruning for quality is to grow the right wood for selection. To do this the main sap flow of the vine must be studied. If this is not done, and the main sap channel is cut away, the result is bound to be water shoots, which will rob the vine, or that portion of it that has been left for fruit. Some of these, unless controlled by tipping, will grow so strong that they cannot be used and will be sawn away again to repeat the round of unbalanced work. If the saw is to be used, it should be for heading back the vine, and not cutting off side branches, thus leaving old wounds which will take years to heal, and allow decay to set in.

A spur has only one purpose, that is, for reforming the vine from a water shoot that may arise from the old arm. As this water shoot has a very shallow grip of the vine, it must be nursed. A one bud spur should be used, and the cane left the following year should be comparatively short. When established the vine may be headed back and so kept under control. Tipping the vine for control is another important matter. The shoots arising from the extreme ends of the canes are tipped first, thus checking those strong robber shoots that take practically all the sap and grow yards in length. This checking has the effect of a better bud burst. A second tipping of these shoots will be necessary before touching those shoots needed for the following season's canes. These are tipped when long enough for use as canes. Further tipping will be necessary where vines are growing strong, only cutting off the smallest amount possible. Tipping the shoots to be used as canes causes fruit buds to form where they can be made use of, which otherwise might be formed at the extreme end of a long runner which would be cut away. The cane grows thicker at the base and tapers off, which tends to give a better bud burst, and a more regular crop. Wrapping on is not necessary, and the canes hanging free become matured and solid. Ploughing should be finished before bud burst, and the ground broken as deeply as possible in the centre between the rows.

IRRIGATION AND MANURING.

Irrigation must be given at the right time. One when the buds are about to burst, one in late spring, and as many as can be obtained in the heat of the summer until the fruit is off the vines. A special irrigation at a critical period might easily make the difference of top or bottom grade, or profit and loss. Manuring must be attended to if good crops of quality fruit are to be maintained. The essential plant foods of the vine are phosphate, potash, and nitrogen. These may be applied in late winter and early spring in fertiliser form on the basis of 3cwts. super, ½cwt. potash, and 1cwt. sulphate of ammonia to the acre. But, as humus is necessary to bring real life into the soil, these plant foods are best added by the use of green manures, such as peas or beans; animal matter, such as blood manures; or by stable manures or grape skins. Soils that are hungry and leached out by water must be treated this way, but soils that are water sodden and salty will only respond to drains. Where green crops are grown, the super should be put in when the seed is sown; by this means more actual plant food is made available to the vine through the action of the growing green crop.

A word of warning should be sounded in regards to disease. Oidium has made its appearance this year in no uncertain form, and, unless sulphuring is attended to, it is likely to reduce the crop greatly next season if conditions are favorable. Sulphur should be dusted on during the growing period at regular intervals, to keep this disease in check. Black spot is another serious disease in this district, and vines should be sprayed with sulphuric acid spray just before bud burst, after which applications of sulphur will help keep it in check. If these precautions against disease are not taken, good quality fruit cannot be expected.

So far as dipping is concerned it is possible to get high grade fruit from all the dips now in use, if weather conditions are right, but it is necessary to have sufficient rack room to get the fruit off while it is at its best and while the weather is good. Whatever dip is being used, see that it is clean, and do not use the dip too long. A dirty dip means low grade fruit.

Only one other thing is necessary for the production of quality fruit: cultivation. Deep cultivation adds a mulch to the soil and conserves moisture, besides keeping down weeds. Summer weeds should be kept down, because they are the breeding ground of Rutherglen fly, besides competing with the vine for the plant foods in the soil.

THE TIPPING OF SULTANAS.

[By H. NEWSTEAD, Renmark.]

The tipping of sultanas has become a practice with many growers along the river. They have adopted what is generally known as the "Volaire system." In this paper it is intended to emphasise a few of the characteristics peculiar to the sultana vine which are essential to a heavy crop of good quality fruit with a high sugar content. This criticism is mainly for the purpose of pointing out that growers sometimes get a poor result and are very muddled as to the cause. Let it be supposed that the grower has some first-class soil, vines are planted very close, he grows enormous green manure crops, and puts back into the soil all the prunings from the vines which bring the soil to a high state of mechanical efficiency. He then manures to the extent of 10cwts. of chemical manure. Finding he has rank growth and no crop he tips, and the result is a three-ton crop. Is it the result of tipping? Consider a few of the causes for loss of crop. Firstly, disease; oidium in the early stages will strip every berry from a vine. The conditions for oidium are ideal. Owing to close planting, narrow rows, and conditions of soil to retain moisture content, there would always be a darkness after the foliage had attained 2ft. 6in. to 3ft. of growth. Secondly, unbalanced vine. As soon as a vigorous sultana is unbalanced it runs to enormous growth, owing to lack of fruit production. There may be other causes, but these being the most likely to affect the crop issue they have sufficed to make a case.

The first tipping should be to retard growth long enough to keep oidium in check sufficiently for flowering to take place, the second and successive applications of the knife to keep the growth to a minimum. In the case of an unbalanced vine, it would keep rank growth from smothering the fruit out of existence.

DAMAGE TO THE VINE.

What actual harm is done to the vine by stunting growth is better left to the scientist, but a few of the effects on the crop are readily seen by all.

The checking of normal growth early in the season forces out lateral growth, the bulk of which is bearing a second crop. As soon as the terminal bud has been removed from a shoot it starts to mature, and in addition to being fed, has to feed the laterals and the fruit thereon.

A sudden check of sap-flow when the flow is at its greatest—early in the season—must have a deleterious effect on the vines, and the flow being from cell to cell—not as a pipe or vein—the effect must reach to the smallest rootlets.

The distribution of sap to the shoots should be equal to all under ideal and well-balanced conditions. Weak shoots through a damaged or diseased bud can never be made anything but weak, and the tipping of the other shoots has no effect whatever on those backward shoots. Backward shoots—if otherwise normal—come away just as well or better without tipping, because there is a continuous sap supply which must make for greater stimulation.

Balance may be upset by many causes, some being too many rods, rods left too long, buds on each end bursting and centres barren, twisted too tightly on wire, rods damaged during twisting, &c., large roots severed close to the vine, damage to butt during close work with implements, &c.

Tipping produces different effects on soils of widely different type; on the strong box flat soil of a cold, clayey texture, where good cultural and manurial practices are followed it has a tendency to make the foliage short, close, and dense, with a lateral at almost every bud down the cane length, and each has a tendency to run away at a great rate if not arrested by the knife.

On light sandy soil the vine appears to peter out more quickly and the second burst of lateral growth seems to be the limit, until the grapes are harvested, which is usually early on this class of soil, when growth begins again. The question of whether the checking of growth has any effect on the development and natural ripening of fruit is one for very close attention. A healthy cane growing normally 6ft. or 8ft. in length, with an average bunch, will ripen and give a greater weight, with a higher sugar content, than a cane of 2ft. 6in. with laterals and a second crop to feed.

The habit of the sultana to keep the canes growing longer is peculiar, but it also has other characteristics, one of which is the delicate nature of the leaves, which soon

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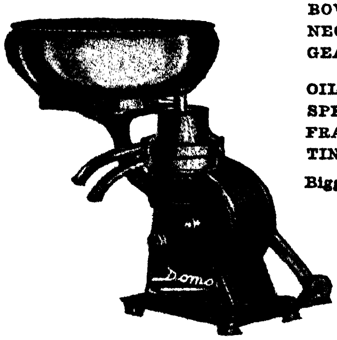

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become torn and wind-worn. A large number ceasing to function very early, the lower ones sometimes having gone by December and early January, and continues throughout the season according to weather conditions. A comparison with a Gordo, which has a strong, small, vigorous leaf, with twice the number per 2ft. of cane showing everyone as vigorous, and functioning as well when the grapes are harvested, as when they are just matured. The good healthy leaves on the sultana are further and further up the cane as the lower ones become useless, which is a good reason for the elongation of growth throughout the growing and ripening period of the grape.

What does balance consist of?—a healthy vine with the correct number of rods of the right length, condition, and fruitful capacity, with good mechanical soil conditions, containing sufficient plant foods, with good cultural methods, care to keep damage as near elimination point as possible. The Merbien Research Station is conducting tests along the Murray, and one proof arising from them is that the longer the cane—growing from fruiting wood laid down—the bigger the bunch and better fruit, a fact one can prove on any variety of vine. The fruit carried on the shoots on the ends of rods which had to be cut back to obviate being torn off by implements was of very poor quality, being watery and immature, drying to skin, or remaining as blobs, which proves that 2ft. of cane cannot mature, it being practically in the same state when harvested as a month earlier. These vines were carrying a 3½ tons crop, all of which was of high quality, excepting on the shoots mentioned.

IRRIGATION.

[By N. S. FOTHERINGHAM, Manager Berri Orchard.]

The effect of over-irrigation is becoming so serious in our irrigation areas on the Murray that a paper on this subject may help to convince settlers in general of the far-reaching harm which has been caused in the past, and will continue to increase in the future, unless the true position is realised and guarded against.

It is no exaggeration to say that at present there are acres of vines and trees on some holdings that have been entirely killed. In some instances lakes have been formed, and in consequence roads have had to be closed. These lakes are generally formed in hollows and have no natural drainage, and this is the cause of them showing up so early in the life of the settlements. Fortunately, in other parts coarse sand has been found, and this, up to the present, has been sufficient to take away superfluous water when it has been led into it by underground drains, and in some instances without their aid. There is no guarantee, however, that this position will last indefinitely. It may be that they are only local pockets of sand surrounded by a more or less impervious soil. If such is the case it is only a matter of time before they become filled with water and thus a danger instead of a help to the settlement. Again it may be that there is a vast system of coarse sand running towards the country's natural drain, the River. Even if this be the case, it is doubtful whether they would be effective for any great length of time, and the aim must be to make the life of these settlements, not a mere matter of years, but of centuries.

It is well known that the further a pipe carrying water extends, the less will be its flow, owing to the extra friction created by the increased length of the pipe. This principle will apply with the under drainage layers of the soil, and the possibilities are that the water will in time cease to run and gradually fill, and the watertable rise sufficiently high to be a danger over most of the area. It has happened in other countries. Let us at least try and prevent the occurrence here.

Soil moisture can be said to exist in the soil in three forms—

1. Hygroscopic.
2. Capillary.
3. Gravity.

Hygroscopic moisture is that which a soil particle holds—even though to the feel it may be dry, it surrounds the whole particle of soil and is of practically no value so far as maintaining plant growth is concerned.

Capillary water is a thickened film of water surrounding the soil particles and partially fills the spaces between the soil particles. It can move upwards, downwards, or laterally or from a wet to a dry soil, and is of importance in maintaining plant growth, as it surrounds the roots and root hairs and contains the crude plant foods extracted from the soil and which the roots absorb and take to the leaves to be manufactured into plant food.

Gravity water is that which moves downward by gravity and is really the excess water of the soil.

The depths to which the roots of vines and trees penetrate and feed varies with the depth of the soils. It may be from 18in. to 4ft. or 5ft. or even more, but it can be taken as a good practical guide that the feeding zone of the root systems of trees and vines is from the cultivation depth to the marl or clay. It is very variable, but it seems the roots do not like the marl, and trenches dug in this area disclose a very distinct diminution of roots as soon as the marl is found. It is therefore reasonable to say that the irrigation need of the soil is for the wetting of the root-feeding zone thoroughly. Any water used above the quantity necessary to wet this feeding zone is therefore waste water, and will cause trouble at some time or another if allowed to accumulate. The aim of practical irrigation is therefore the thorough wetting of the soil comprising the feeding zone of the roots and reducing to a minimum that of waste water. There are, however, many difficulties to be contended with in this object. The nature of the soil, the grade and length of the irrigation run, all have a big influence on successful watering of a soil.

Soils of a light sandy nature such as are found on spinifex ridges are very difficult to deal with satisfactorily. The grade on these soils must not be too flat, otherwise water can be poured into them for days without reaching the end of the furrow. The water percolation in this type of soil is rapid in a downward direction and very slow in lateral movement. If the grade on this type of soil be too steep, difficulty is found with erosion of the furrow and its consequent flattening out. If this happens it is practically impossible to confine the water to the furrow in which it is wanted. It is recommended in this type of soil that the length of run be shortened, the furrows made with ploughs, and in order to saturate the feeding zone, that the furrows be placed as close as practicable. Any method whereby the soil can be firmed is advised; for instance, the sowing of green crops, encouraging grass growth during winter, the application of gypsum, stable manure, straw, distillery skins, stalks from the packing sheds all help to firm this loose sand, besides adding humus and plant food, and are a distinct advantage.

FURROW IRRIGATION.

There are many methods of irrigation, but it is sufficient to deal with the one that most blockers are bound to practise. This is the furrow system, and consists of running a plough or buster furrows in the trellis or tree rows and connecting them to a channel outlet. This system—as carried out in the past—is not the best to operate, because it tends to over-saturation of the soil at the channel end with a consequent rise in the watertable.

Except in the heaviest soils, the lateral moisture movement is much slower than the downward, and the old system of allowing only a small stream of water in the furrow so that it apparently soaks laterally as it goes along, has caused incalculable damage in the formation of watertable.

A method of furrow irrigation recommended that will give good results and a minimum water wastage is as follows:—As many furrows as possible are run down the tree or vine rows; these are connected to the irrigation channel and the water turned into them in sufficient quantity to get through the whole length of furrow in as short a time as possible, consistent with keeping the furrow intact. When through, the furrow stream is then regulated so that a minimum amount of water is trickling over the end of the furrow. This is kept on until the feeding zone is sufficiently wet. It is not a lazy man's method of irrigating. Strict attention has to be paid to the regulation of the water, and it is a night and day job. The greatest drawback to this method being generally adopted is the question of being able to control the water at the outlet end. The old type of outlet used on most of the area has only to be opened a very little and the least bit of leaf, stone, or slime coming along with the water is sufficient to block the aperture in the outlet pipe and stop the flow. With the object of being able to control water at the outlet a new design has been adopted at the Government Orchard and its working in practice has been satisfactory.

The best times for irrigating vines are winter where conditions are dry, early spring before bud burst, prior to setting, December, and pre-harvest. In a system of irrigation settlement such as the River blockers work under, there can never be ideal water application throughout the area; some settlers may get it early, others late, but in order that it be carried out as nearly as possible to the times mentioned, it becomes necessary to get through an irrigation as quickly as possible and by the settler realising that the whole of the area is generally over-watered and making up his mind to try and cut down the amount he is using—without in any way stinting the trees or vines—then a lot will have been done to help get through the irrigations at the correct times and in cutting down the waste water and its harmful effect. Attention has to be paid to the water so long as it is running, and every grower should realise the danger, practise and advocate a system of using less water, and giving just as much efficiency.

Far West Coast Conference, Ceduna, July 5th, 1933.

FACTORS THAT WILL ASSIST IN THE DEVELOPMENT OF UPPER EYRE'S PENINSULA.

[By G. Lovelock, Smoky Bay.]

It is with a certain amount of diffidence that I approach this subject, because I feel that there are many farmers who have had longer experience of farming in this locality, and who are in a better position to appreciate its possibilities. Those of us who have the interests of this district at heart cannot but realise that the land is not as yet by any means producing, or nearly producing, maximum returns.

From Cungena up there is an evenness of light quality land easy to work, of an area to be found nowhere else on Eyre's Peninsula, and when properly developed will be capable of supporting factories for the handling of side lines which are so essential for farmers to incorporate with the growing of wheat.

When we review the early settlement we cannot but pay a tribute to the pioneers who with little or no capital managed the developmental work, but when we review the present farming practices we cannot but realise, unfortunately, that in many instances there has been little or no improvement on the pioneers' methods. By no means do I wish to disparage the pioneers' work, as they did it well, but during the last 30 years farming methods have undergone great changes, and where farming is ever a precarious proposition in this country, we should be among the first to avail ourselves of any improvement in methods.

The number of farmers obtaining low yields in County Way is illustrated in the following table:—

WHEAT FARMERS.

(Not compiled prior to 1925-26.)

Year.	0–3 Bushels.	3–6 Bushels.	6–9 Bushels.	9–12 Bushels.	12–15 Bushels.	15 and Over Bushels.
1925-26	5	52	70	40	12	2
1926-27	13	71	91	19	1	—
1927-28			Not compiled			
1928-29	203	12	1	—	1	—
1929-30	214	10	3	—	—	—
1930-31	217	17	1	—	—	—
1931-32	7	32	71	68	39	15
1932-33			Not yet available			

We often find that experimental results obtained in other localities are disregarded on the grounds that conditions where these experiments are conducted are different from ours. While there may be arguments both for and against this, it appears to me that the primary duty of the Agricultural Department is to endeavor to get the farmers to use the best methods that will give to them maximum mean pecuniary returns. On the plea of Government economy, Minnipa and Veitch, in common with other Experimental Farms, have been closed. The results from these farms could be taken as a guide, as their conditions and ours are a deal the same, but many do not avail themselves of these results. I would put forward as a suggestion that a series of experiments, say:—Wheat and Oat Varieties, Crop Rotation, Cultivation Methods, just to mention a few, be conducted by a member of each Bureau in County Way under the supervision of the Agricultural Instructor.

We have had practical proof (by manurial experiments at Smoky Bay) that such experiments create a deal of local interest and a resultant stimulus in the operations of those interested.

COUNTY WAY.

Year.	Wheat on Fallow.		Average per Acre. Bushels.	Wheat Not on Fallow.		Average per Acre. Bushels.
	Acres.	Bushels.		Acres.	Bushels.	
1923-24	No records					
1924-25	19,831	98,469	4·96	47,587	184,332	3·87
1925-26	10,819	104,050	9·61	57,478	416,219	7·24
1926-27	15,260	111,250	7·29	63,660	387,992	6·09
1927-28	15,061	85,386	5·66	73,614	390,558	5·30
1928-29	13,080	27,504	2·10	89,888	92,829	1·03
1929-30	13,277	23,558	1·77	94,444	101,721	1·07
1930-31	9,807	17,511	1·79	110,098	153,740	1·39
1931-32	8,962	106,040	11·96	108,352	1,050,127	9·69
1932-33	11,770	85,313	7·24	107,689	634,392	6·17
Means. 9 years			5·82bush.			4·65bush.

About 8 per cent. of the acreage cropped are on fallow and 2 or 3 per cent. are put under oats.

Looking at the above figures we find that the average wheat yield is about 5bush. to the acre for the past nine years, inclusive of both fallow and other land, with fallow giving a yield of nearly 6bush.—an increase of a little over a bushel. This is a very small amount, but I feel that the yields on fallow could be doubled. Taken over a period of years at Veitch, fallow has given a return of 12bush. 13lbs. In quoting Veitch I do so believing their conditions are very similar to ours.

The rainfall is as follows:—

	Average Rainfall.	Average Useful Rainfall.
Veitch	11.86	8.77
Konibba	11.82	9.23
Denial Bay	11.36	9.40
Ceduna	9.98	8.04
Smoky Bay	10.28	8.71

It appears that the prime essential of farmers at present is to adopt a crop rotation, and the association of sheep with wheat growing. This very important system of wheat growing is not being given the attention that it merits. I would suggest a three-year rotation, as a very minimum, and when sufficient land is available a four-year rotation is to be preferred.

There is an area of 290,000 acres cleared for cultivation in County Way, and were we to reduce the acreage under wheat each year to 80,000 or 90,000 instead of 125,000 as last year, and endeavor to raise the average yield to 12bush.—as I do believe can be done—we should find ourselves a deal better off.

Sowing oats on all wheat stubble will, besides providing more feed, assist to reduce wheat diseases.

In dealing with this matter I wish it to be understood that only properly cleared land can be considered, because owing to the risk of newly cleared land drifting if fallowed, and the necessity for coping with shoots, it is not possible to fallow such until after having grown several crops of wheat.

The older land which one expects to provide the bulk of the wheat could be worked as follows:—

1st year—Bare fallow.
2nd year—Wheat.
3rd year—Oats for grain, hay or pasture.
4th year—Oats for pasture.

My reasons for this rotation are as follows:—

(*a*) Increased yields by growing wheat exclusively on fallow.
(*b*) By growing oats as the second year's crop and regard it as one of secondary importance, to be put in early and dry. One can then sow the wheat in the most favorable time.
(*c*) The oats would, in many years, provide valuable reserves of fodder.
(*d*) The farm would be able to support more stock.
(*e*) The oats would improve the land for following wheat crop. This rotation implies wheat on fallow only.

We have lately had a deal of agitation for a butter factory and at times have heard of freezing works, bacon factory, &c., but we must not put the cart before the horse. That the district can and will support such factories none can doubt, but it is first necessary that we so organise our farm operations that we can give them adequate support. Making ensilage and putting by several stacks of hay during the good years will be an inducement to stock more heavily, and the best insurance against drought. I do not think it is any misstatement to say that the trouble and expense of providing feed for one's stock has been one of the worst factors of droughts, and as we can expect a periodical recurrence of such, we should, during the years when feed and growth are abundant, endeavor to put up reserves.

In conclusion I would summarise the foregoing:—

1. Adopt a crop rotation.
2. Grow wheat on fallow exclusively where possible.
3. Put all wheat stubble land in with oats.
4. Put by several reserve stacks of hay and ensilage during good years.

[*Papers Read at Conferences.*]

ACCOMMODATION PROVIDED FOR FARM IMPLEMENTS.

[By A. J. BOWELL, Laura Bay.]

During the past twenty years I have ridden on implements of several makes, and have not encountered one on which it was really comfortable to ride. The general impression one gathers from implement seats is more or less permanent and sometimes decidedly painful. The great majority of these so-called seats—"perches" would be a better name—resemble a piece of sheet metal which has been run over by a steam roller, then shot full of holes, and finished off with a non-skid design in the middle for luck. In about one case out of a dozen provision is made for adjustment to suit the height and reach of the user. Some of the tractor manufacturers have made a certain amount of improvement in this direction, but have not yet reached anything like an ideal. It would appear that the more strenuous a life one is called upon to lead the less comfort one is expected to enjoy while at work.

One of the first things noticed on entering any modern office is the comfortable chairs provided for both employer and employee. It is not suggested that office workers are not entitled to these comforts; but, if people whose work calls for very little physical exertion are made comfortable how much more should the man whose work is practically all manual be made as comfortable as possible.

I do not propose that our implements should be fitted with swivel chairs, upholstered in moquet or Genoa velvet, but they could and should be fitted with a seat deep enough and wide enough to give room for a little padding around the back and a cushion of some sort.

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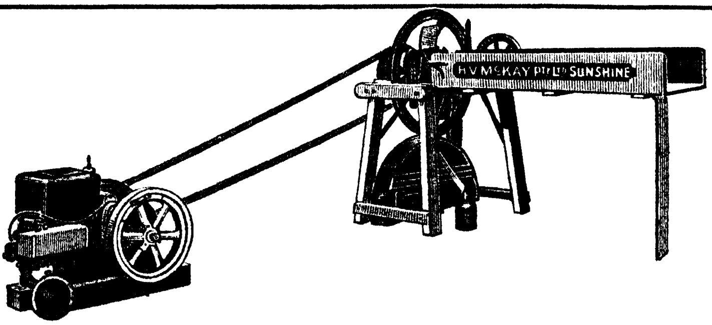

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AGRICULTURAL BUREAU CONFERENCES.

RIVER MURRAY.

The 1933 Conference of Fruit Growing Branches situated in the Irrigation areas of the River Murray was held on June 15th in the presence of a very good attendance of delegates from the Light's Pass, Barmera, Moorook, Lone Gum, Winkie, Waikerie, Ramco, Renmark, and Block E Branches, and Messrs. J. B. Murdoch (Member of Advisory Board of Agriculture), W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), N. Fotheringham (Manager Berri Orchard), F. R. Arndt and J. B. Harris (District Instructors), J. Williams (Roseworthy Agricultural College), Professor J. Prescott (Waite Research Institute), H. C. Pritchard (General Secretary), and F. C. Richards (Assistant Secretary), representing the Department of Agriculture. The following papers aroused a keen and instructive discussion:—''Irrigation,'' Messrs. A. Mills and N. Fotheringham; ''Growing the Sultana,'' L. Chapple (Berri); ''Tipping Sultanas,'' H. Newstead (Block E).

In addition to a number of questions which were discussed by Departmental Officers, Conference resolved:—''That it be a recommendation from the Conference that the Department of Lands be requested to institute the scientific system of irrigation as outlined by the Council for the Scientific and Industrial Research in Pamphlet No. 26;'' ''That the District Horticultural Instructor at Berri be connected by telephone;'' ''That the 1934 Conference be held at Barmera;'' ''That the name of Mr. Quinn be perpetuated by the naming of the new orange now being distributed by the Berri Orchard;'' ''That this Conference strongly recommends to growers the adoption of a universal and defined policy of lighter waterings as a first step in assisting the Departments concerned in combating the increased salt and seepage trouble.''

The following addresses were delivered:—''Drainage in Irrigated Areas,'' by Mr. W. J. Spafford, and ''The Work of the Council for Scientific and Industrial Research in the Irrigation Areas, with special reference to that of the Division of Soils,'' by Professor J. Prescott.

EYRE'S PENINSULA (WEST).

The Branches of the Agricultural Bureau in the western portion of Eyre's Peninsula held their annual Conference on Wednesday, July 5th, when Mr. G. Lovelock (Smoky Bay) presided over well attended meetings of delegates. Mr. S. Shepherd (Advisory Board of Agriculture) delivered the opening address, and the Department of Agriculture was represented by Messrs. W. J. Spafford (Deputy Director of Agriculture), H. B. Barlow (Chief Dairy Instructor), W. H. Brownrigg (District Agricultural Instructor), W. G. Bennett (Lecturer on Veterinary Science, Roseworthy College), and H. C. Pritchard (General Secretary Agricultural Bureau).

Mr. Shepherd referred to the reliance which farmers should place on the quality of wheat they sow. They should procure varieties true to type and those which have proved to be suitable to the district. The Turretfield Seed Wheat Farm could not produce seed in sufficient quantity to supply the whole of the State, and as the Minnipa Farm was in the Eyre's Peninsula district, he hoped that it would be reopened for the benefit of the west coast as a whole.

There was a lot of mongrel wool in farm clips in the mallee areas, and he advised farmers, if their clips were too small for classing on the farm, to send the wool to be handled by the brokers at a small fee for the work. If there were 8 to 10 bales in a clip there might be up to 10 different classes of wool in them, and if these were reclassed by the sellers the wool would bring double the money.

He considered that the district could breed draught stock as sound as in any part of the world. He warned his hearers, however, to guard against Eyre's Peninsula becoming the dumping ground for rejects from other parts. Hereditary soundness was an important factor in the industry, and only the best stock that it was possible to buy should be used for breeding. The same principle applied to other forms of farm livestock. There had been a change in the class of pig required on the market, and he had noticed that the type that was most suitable to-day was similar to that which was bred fifty years ago, but which had been discarded by breeding for show purposes.

Mr. A. J. Bowell (Laura Bay) and Mr. G. Lovelock (Smoky Bay) read papers respectively on ''Accommodation Provided on Farm Implements'' and ''Factors that will Assist in the Development of Upper Eyre's Peninsula.'' These papers are published elsewhere in this issue.

Mr. W. G. Bennett gave an address on ''Common Ailments of Stock,'' and replied to numerous questions relating to farm livestock.

During the day Messrs. W. J. Spafford and H. B. Barlow gave a variety of information through the medium of replies to questions and discussions on such subjects as the best varieties of wheat for milling purposes, the growing of macaroni wheats, the value of oats for feeding, underground tanks as ensilage pits, the value of raw guano as a fertiliser, &c.

In the evening Mr. Spafford gave an illustrated address on ''Wheat Diseases and How to Combat Them.''

The following resolutions were carried:—(1) ''That the Federal Government be asked to form a Home Consumption Pool at a price sufficient to bring the total harvest to the average price of 3s. 6d. per bushel''; (2) ''That Local Boards be formed to deal with applications for assistance to Farm Relief Boards, as delay in this respect becomes a hardship and defeats the object''; (3) ''That a veterinary surgeon be attached to the Department of Agriculture for the purpose of giving lectures and demonstrations to Branches''; (4) ''That the motor tax be abolished and wharfages be reduced''; (5) ''That the next Conference be held at Ceduna under the auspices of the Mudamuckla Branch.''

FARMERS—
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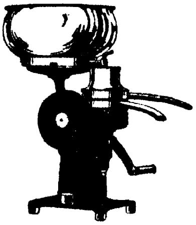

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ADVISORY BOARD OF AGRICULTURE.

The monthly meeting was held on June 28th, there being present Messrs. H. N. Wicks (Chairman), A. M. Dawkins, F. Coleman, P. J. Baily, S. Shepherd, A. L. McEwin, J. W. Sandford, G. Jeffrey, R. H. Martin, Professor A. J. Perkins (Director of Agriculture), Dr. A. E. V. Richardson (Director Waite Research Institute), and H. C. Pritchard (Secretary). Apologies were received from Messrs. A. J. Cooke and J. B. Murdoch.

Cape Tulip.—In compliance with the resolution of the Bordertown Conference in April, the corporations of Mount Gambier and Naracoorte, as well as district councils in the South-East, have been informed through the Local Government Department about the spread of cape tulip, and attention called to the powers and responsibilities of district councils with regard to its eradication. Councils have also been advised that wherever practicable continuous cultivation has been found successful in overcoming the weed.

Dehorning Bulls.—The Royal Agricultural and Horticultural Society intimated that the suggestion that the Society should encourage dehorning of bulls in dairy herds by suggesting to judges that they should not allow any points for a bull's horns when judging, had already received the consideration of the committee. While recognising the paramount importance of human life, the committee felt that the suggestion submitted was one that was unlikely to bring about the objective sought by the Dairy Conference at Mount Barker. Following a proposal by Mr. Baily, the Secretary was instructed to transmit the resolution from the Mount Barker Dairy Conference to the Australasian Jersey Herd Book Society for an expression of opinion.

Lighter Waterings on Irrigation Areas.—The following resolution was received from the River Murray Conference:—"That this Conference strongly recommends to growers the adoption of a unversal and definite policy of lighter waterings as a first step in assisting the departments concerned in combating the increased salt and seepage trouble." It was also decided to give publicity to this resolution through the River Branches.

Life Membership.—The following names were added to the roll of Life Members of the Agricultural Bureau:—Messrs. H. Jacobs, H. Lewis, J. Tozer (Cherry Gardens), H. Jasper (Morchard), S. G. McCallum, C. H. McCallum, W. B. Bull, H. Crisp (Willowie), A. M. Laurie (Nelshaby).

New Branches.—Approval was given for the formation of Branches of the Agricultural Bureau at Booborowie, Taplan (Women), and Laura Bay (Women), with the following as foundation members:—*Booborowie*—G. Pryde, S. Gordon, A. T., G. G., and N. Fairchild, P. A. Kilderry, F. C. Catt, W. F. McEvoy, N. C. and B. H. Woodgate, J. P. Cousins, W. Kelly, J. F. and M. Hogan, E. J. Affolter, W. Hardy, D. Keynes, T. J. Weddy, W. Kain, W. J., F., and T. Shattock, W. G. Gunn, H. Phillips, P. B. Armstrong, T. J. Bailey, H. Baynes, J. Clare, R. G. Mayfield, T. E. Travers, R. Morris. *Laura Bay Women's*—Mesdames Bowells, D. F. Morrison, — Hoffrichter, F. Edson, — Burk, — Blumson, J. McInerheney, Misses L. and E. Hoffrichter, R. and L. Blumson. *Taplan Women's*—Mesdames T. Fogden, G. Stewart, W. Weston, P. Bates, A. F. Scheadle, D. Chancellor, J. D. Neaylon, B. Moffatt, P. R. Hodge, W. Flynn, E. Hienze, E. H. Schultze, F. Barton, R. Turner, and Misses A. Day and M. Flynn.

New Members.—The following names were added to the rolls of existing Branches:—Renmark—A. Cunningham, W. Symonds, J. van Velsen, E. W. Telfer; Miltalie—Ray Story, Cummins—W. B. Walkom; Sutherlands—W. Pfeiffer, J. Murphy, A. Twartz, H. Niemz; Murray Bridge—F. S. Burr; Dudley—M. B. Telfer; Yandiah—Oscar Keller; Allandale East—B. Carlin.

Number of members, 7,998; number of Branches, 328.

DAIRY AND FARM PRODUCE MARKETS.

MESSRS. A. W. SANDFORD & CO., LIMITED, reported on July 3rd, 1933:—

BUTTER.—Although the season opened auspiciously in May, the rainfall in June was very disappointing, light showers only falling in certain areas, but where most needed little was received. The result is that the pastures are now backward, and the cold weather and frosts received have checked the growth. Supplies of cream to our factories, although showing a slight increase each week, are considerably behind the quantity received for the corresponding period last year, and export figures have suffered in consequence. Local demand throughout June kept up well, and the surplus was quitted to London; but prices there have not shown any appreciable hardening. Advices, however, from Britain now indicate a more optimistic tone. Choicest creamery fresh butter in bulk, 1s. 0¾d.; prints and delivery extra. (These prices are subject to the stabilisation levies.) Store and collectors', 7d. to 8d. per lb. at store door, less usual selling charges. Special lots higher.

EGGS.—Production increased very rapidly, and with the local demand having weakened, there is now an increasing surplus each week. Some exporters have already commenced packing for Britain, which is phenominally early, but an outlet has now to be obtained for the eggs, and there is therefore no alternative but to get stocks away. Values eased rapidly, but should steady as soon as export parity is reached. Ordinary country eggs, hen or duck, 6d. per dozen; selected, tested, and infertile higher.

CHEESE.—The production in the South-East has shown no improvement during the last few weeks, as rain is needed there and the cold weather has checked the feed, so that the supplies of milk are practically stationary. There is sufficient cheese being manufactured, however, for local needs, and consignments cleared satisfactorily from week to week. New makes, medium and large, 8¼d. to 8¾d.; loaf, 8¾d. to 9¼d.; semi-matured and matured, 10d. to 11d. per lb.

BACON.—Owing to the hardening in prices of live hogs, values for bacon firmed several times in June, but this did not cause any check in consumption, and rates even now are not unreasonably high. The factories marketed sufficient quantities for all requirements, and stocks were kept clear from week to week. Best local sides, 8¾d. to 9d.; best factory cured middles, 9½d. to 10d.; large, 9d.; rolls, 6½d. to 7d.; hams, 10½d. to 11d. per lb.; cooked, 1s. to 1s. 1d. Lard, prints, 4s. 6d. per dozen.

ALMONDS.—The sale of almonds was well maintained throughout the month and heavier quantities than usual were disposed of. Values firmed during the month and are now steady. Softshells and Brandis, 8¾d. to 9½d.; hardshells, 5d. to 5½d. per lb.; kernels, 1s. 11d. to 1s. 11½d. per lb.

HONEY.—The usual winter demand for honey continued, but sales of parcel lots interstate were few and far between. Values were without alteration. Prime clear extracted in liquid condition, 3d. to 3¼d. per lb.; lower grades, 1½d. to 2½d. per lb.

BEESWAX was in better supply and all consignments cleared; 1s. 0½d. to 1s. 1d. per lb., according to sample.

LIVE POULTRY.—There was a strong demand experienced throughout June for all classes of poultry, but more particularly for prime quality table birds. As poulterers are carrying only light stocks, we anticipate that the good demand will continue, and advise consigning. Crates loaned on application. Prime roosters, 3s. to 4s.; nice-conditioned cockerels, 2s. 5d. to 2s. 11d.; fair-conditioned cockerels, 1s. 10d. to 2s. 4d., chickens lower. Heavy weight hens, 2s. 2d. to 3s. 2d.; medium hens, 1s. 8d. to 2s. 1d.; light hens, 1s. 5d. to 1s. 8d.; couple of pens of weedy sorts lower. Geese, 2s. 6d. to 3s. 6d.; goslings lower. Prime young Muscovy drakes, 3s. to 4s.; young Muscovy ducks, 2s. to 2s. 6d.; ordinary ducks, 1s. 6d. to 2s. 3d.; ducklings lower. Turkeys, good to prime condition, 7½d. to 10d. per lb. live weight; turkeys, fair condition, 6d. to 7d. per lb. live weight; fattening sorts lower. Pigeons, 3½d. to 4½d. each.

POTATOES.—Local new, 5s. 6d. per cwt.

ONIONS.—New season's, 5s. 6d. per cwt.

RAINFALL TABLE.

The following figures, from data supplied by the Commonwealth Meteorological Department, show the rainfall at the subjoined stations for the month of June, 1933, also the average precipitation for the month of June, and the average annual rainfall.

Station.	For June, 1933.	Av'ge for June.	Av'ge Annual Rainfall.
Far North and Upper North.			
Oodnadatta	0·03	0·62	4·70
Marree	—	0·72	5·89
Farina	—	0·86	6·47
Copley	0·10	1·07	7·94
Beltana	—	1·09	8·54
Blinman	—	1·61	11·95
Hookina	0·06	1·83	11·53
Hawker	0·11	1·92	12·30
Wilson	0·04	1·82	11·78
Gordon	0·06	1·51	10·63
Quorn	0·14	1·83	13·29
Port Augusta	0·23	1·17	9·42
Bruce	0·07	1·37	9·93
Hammond	0·13	1·42	11·31
Wilmington	0·43	2·45	17·43
Willowie	0·08	1·67	12·19
Melrose	0·52	3·34	22·85
Booleroo Centre	0·45	2·19	15·15
Port Germein	0·63	1·53	12·43
Wirrabara	0·54	2·74	19·21
Appila	0·59	1·79	14·57
Cradock	0·02	1·59	10·83
Carrieton	0·12	1·68	12·31
Johnburg	0·13	1·34	10·61
Eurelia	0·24	1·71	12·87
Orroroo	0·17	1·77	13·21
Nackara	0·03	1·42	11·16
Black Rock	0·09	1·60	12·41
Oodlawirra	0·26	1·43	11·56
Peterborough	0·37	1·61	13·21
Yongala	0·47	1·85	14·42
North-East.			
Yunta	0·15	1·00	8·50
Waukaringa	0·16	1·04	8·00
Mannahill	0·12	0·92	8·28
Cockburn	0·38	0·96	7·96
Broken Hill	0·06	1·18	9·63
Lower North.			
Port Pirie	0·70	1·76	13·17
Port Broughton	0·65	2·05	13·93
Bute	1·01	2·31	15·36
Laura	1·01	2·44	17·91
Caltowie	0·80	2·08	16·69
Jamestown	0·65	2·33	17·71
Gladstone	1·04	2·09	16·29
Crystal Brook	1·03	2·18	15·78
Georgetown	0·95	2·47	18·35
Narridy	0·75	2·20	15·85
Redhill	1·34	2·41	16·55
Spalding	0·88	2·59	18·99
Gulnare	1·35	2·60	18·56
Yacka	0·91	2·13	15·33
Koolunga	0·70	2·15	15·40
Snowtown	0·94	2·26	15·64
Lower North.—*continued.*			
Brinkworth	1·20	2·31	15·74
Blyth	0·79	2·24	16·77
Clare	1·03	3·40	24·53
Mintaro	0·68	3·40	23·42
Watervale	0·86	3·80	26·91
Auburn	0·70	3·16	23·98
Hoyleton	0·62	2·26	17·32
Balaklava	0·52	1·94	15·49
Pt. Wakefield	1·05	1·64	12·93
Terowie	0·37	1·56	13·35
Yarcowie	0·46	1·68	13·57
Hallett	0·63	2·17	16·40
Mount Bryan	0·55	2·31	16·65
Kooringa	0·47	2·41	17·89
Farrell's Flat	0·61	2·58	18·65
West of Murray Range.			
Manoora	0·71	2·49	18·83
Saddleworth	0·58	2·53	19·55
Marrabel	0·66	2·73	19·84
Riverton	0·66	2·78	20·75
Tarlee	0·70	2·36	18·11
Stockport	0·55	2·29	16·88
Hamley Bridge	0·58	2·29	16·54
Kapunda	0·68	2·51	19·79
Freeling	0·44	2·45	17·85
Greenock	0·55	2·94	21·56
Truro	0·25	2·77	19·96
Stockwell	0·48	2·85	20·12
Nuriootpa	0·50	2·98	20·64
Angaston	0·46	3·24	22·43
Tanunda	0·49	3·25	22·02
Lyndoch	0·68	3·65	23·45
Williamstown	1·00	4·76	27·71
Adelaide Plains			
Owen	0·57	1·67	14·33
Mallala	0·60	2·34	16·56
Roseworthy	0·58	2·49	17·34
Gawler	0·55	2·64	18·96
Two Wells	0·91	2·33	15·70
Virginia	0·69	2·55	17·12
Smithfield	0·70	2·65	17·50
Salisbury	0·78	2·80	18·54
Adelaide	1·33	3·13	21·10
Glen Osmond	1·62	4·33	25·96
Magill	1·45	4·12	25·50
Mount Lofty Ranges.			
Teatree Gully	1·19	4·55	27·30
Stirling West	4·16	8·14	46·91
Uraidla	3·46	7·64	43·91
Clarendon	2·29	5·30	32·82
Morphett Vale	1·65	3·48	22·64
Noarlunga	1·21	3·20	20·34
Willunga	2·06	4·00	26·01
Aldinga	1·32	3·30	20·21

RAINFALL—*continued.*

Station.	For June, 1933.	Av'ge for June.	Av'ge Annual Rain-fall.
MOUNT LOFTY RANGES—*contd.*			
Myponga	1·96	4·97	29·48
Normanville ...	1·99	3·29	20·69
Yankalilla	1·99	3·88	22·85
Mount Pleasant	0·59	4·31	27·18
Birdwood	0·93	4·82	29·15
Gumeracha	1·26	3·42	33·39
Millbrook Res. .	1·14	5·63	34·86
Tweedvale	2·18	6·22	35·89
Woodside	1·46	5·34	32·25
Ambleside	2·03	5·69	34·87
Nairne	1·41	4·26	28·09
Mount Barker ..	1·84	4·68	31·79
Echunga	2·54	5·31	33·15
Macclesfield	2·12	4·52	30·43
Meadows	2·19	5·61	36·12
Strathalbyn	1·19	2·54	19·34
MURRAY FLATS AND VALLEY.			
Meningie	1·36	2·68	18·37
Milang	0·81	2·15	14·92
Langhorne's Ck.	0·94	1·94	14·76
Wellington	0·57	1·94	14·56
Tailem Bend ...	0·83	1·85	14·70
Murray Bridge .	0·77	1·68	13·59
Callington	0·62	2·00	15·20
Mannum	0·36	1·39	11·47
Palmer	0·29	2·02	15·43
Sedan	0·12	1·62	12·11
Swan Reach ...	0·28	1·26	10·60
Blanchetown ...	0·25	1·22	11·04
Eudunda	0·52	2·29	17·11
Sutherlands	0·18	1·43	10·82
Morgan	0·29	1·01	9·20
Waikerie	0·22	1·19	9·66
Overland Crnr...	0·03	1·14	10·41
Loxton	0·18	1·28	11·59
Renmark.......	0·21	1·14	10.49
WEST OF SPENCER'S GULF.			
Eucla	1·01	1·08	9·98
Nullarbor	1·20	1·32	8·73
Fowler's Bay ...	0·67	2·21	11·82
Penong	0·91	1·94	12·12
Koonibba	0·94	1·82	11·82
Denial Bay	0·61	1·87	11·36
Ceduna	0·58	1·58	9·95
Smoky Bay	0·71	1·88	10·28
Wirrulla	0·34	1·87	10·08
Streaky Bay ...	0·59	2·87	14·82
Chandada	0·70	—	—
Minnipa........	0·45	2·37	13·68
Kyancutta	0·59	—	—
Talia	0·63	2·73	14·63
Port Elliston ...	1·83	3·28	16·39
Yeelanna.......	0·55	2·68	15·72
Cummins.......	1·04	3·16	17·35
Port Lincoln....	1·38	3·23	19·34
Tumby	1·52	1·91	13·92
Ungarra	1·36	2·48	16·73
Carrow	1·91	1·74	13·08
Arno Bay	1·62	1·59	12·44
WEST OF SPENCER'S GULF—*contd.*			
Rudall	1·49	1·52	12·19
Cleve	2·34	1·92	14·66
Cowell	1·74	1·25	11·10
Miltalie	1·49	1·68	13·54
Darke's Peak ..	0·81	2·32	14·92
Kimba	0·56	1·61	11·52
YORKE PENINSULA.			
Wallaroo	0·90	2·09	13·91
Kadina	0·79	2·29	15·61
Moonta	0·70	2·24	15·05
Paskeville	0·70	2·37	15·46
Maitland	0·99	3·09	19·90
Ardrossan	1·00	2·05	13·93
Port Victoria ...	0·58	2·33	15·40
Curramulka	1·60	2·80	17·87
Minlaton	0·96	2·85	17·80
Port Vincent ...	1·54	2·36	14·40
Brentwood	0·97	2·39	15·45
Stansbury......	1·67	2·52	16·81
Warooka	1·35	2·73	17·51
Yorketown	1·67	2·64	16·94
Edithburgh.....	2·03	2·41	16·34
SOUTH AND SOUTH-EAST.			
Cape Borda	2·88	4·63	24·83
Kingscote	2·96	3·02	19·11
Penneshaw	3·61	2·77	18·85
Victor Harbor ..	2·31	3·22	21·27
Port Elliot	1·94	2·85	19·91
Goolwa	1·65	2·46	17·81
Copeville	0·17	1·44	11·44
Meribah........	0·23	1·29	11·10
Alawoona	0·29	1·41	10·02
Mindarie	0·13	1·56	11·91
Sandalwood	0·32	1·85	13·57
Karoonda	0·44	1·83	14·33
Pinnaroo	0·41	1·75	14·54
Parilla	0·62	1·80	13·90
Lameroo	0·52	2·01	16·08
Parrakie	0·41	1·78	14·49
Geranium	0·57	2·01	16·41
Peake	0·46	2·00	16·03
Cooke's Plains ..	0·38	2·08	15·38
Coomandook ...	0·64	2·34	17·11
Coonalpyn	0·78	2·38	17·42
Tintinara	0·84	2·56	18·60
Keith	0·68	2·32	17·87
Bordertown	0·99	2·60	19·22
Wolseley	1·03	2·45	18·41
Frances	0·94	2·58	19·99
Naracoorte	1·92	3·26	22·59
Penola	1·64	3·57	26·06
Lucindale	1·94	3·54	23·16
Kingston	1·65	3·98	24·33
Robe	3·82	4·05	24·64
Beachport	3·95	4·68	26·93
Millicent	3·37	4·67	29·76
Kalangadoo	3·14	4·29	32 03
Mount Gambier	2·85	4·03	30.52

AGRICULTURAL BUREAU REPORTS.

INDEX TO CURRENT ISSUE AND DATES OF MEETINGS.

Branch.	Report on Page.	Dates of Meetings.	
		July.	Aug.
Adelaide	*	—	—
Allandale East	†	7	4
Appila-Yarrowie	†	7	4
Ashbourne	*	5	2
Auburn Women's	*	R	25
Balaklava	*	—	—
Balumbah	†	—	—
Balumbah Women's	*	5	2
Beetaloo Valley	†	3 & 31	—
Belalie Women's	†	11	—
Berri	*	5	9
Belvidere	*	—	—
Blackheath	†	13	10
Black Springs	†	—	—
Blackwood	1443	10	14
Blyth	*	28	25
Booleroo Centre	*	7	4
Boolgun	1439	—	3
Boor's Plains	*	6 & 29	3
Bowhill	*	3 & 31	—
Brentwood	1435	6	3
Brinkley	*	5	2
Brinkworth	*	3 & 31	—
Buglo	*	11	8
Bute	*	20	17
Caliph	*	4	1
Caralue	*	5	2
Carrow	*	5	2
Cherry Gardens	†	1	5
Chilpuddie Rock	1435	—	—
Clare Women's	†	—	—
Clarendon	*	3 & 31	—
Cleve	*	1	5
Collie	*	5	2
Coomandook	†	28	25
Coonawarra	†	—	20
Coonawarra Women's	†	19	16
Cummins	*	14	11
Cungena	†	6	3
Currency Creek	†	10	7
Dudley	†	20	1 & 29
Elbow Hill	1436	6	3
Eudunda	*	3	7
Eurelia	*	8	12
Eurelia Women's	*	5	2
Farrell's Flat	*	28	25
Finnis	†	—	—
Frances	*	—	—
Frayville	1444	—	—
Gawler River	†	—	—
Georgetown	*	1	5
Geranium	*	29	26
Gladstone	*	7	4
Gladstone Women's	†	14	11
Glencoe	*	11	8
Goode	1436	5	9
Goode Women's	*	5	9
Greenock	1431	10	—
Green Patch	*	6	3
Gumeracha	*	10	8
Hanson	*	11	1
Hartley	†	5	—
Hindmarsh Island	*	—	—
Hope Forest	†	3	7
Hoyleton	*	17	17
Inman Valley	†	20	17
Jamestown	*	19	16
Jervois	*	13	10
Kalangadoo Women's	†	8	12
Kalangadoo	*	8	12
Kalyan	*	19	16
Kangarilla Women's	*	20	17
Kanni	*	—	—
Kapinnie	*	—	—
Kapunda	*	14	11
Karoonda	*	5	9
Keith	*	6	3
Kelly	†	1	5
Kilkerran	*	11	8
Kongorong	*	3 & 31	—
Koonibba	*	6	3
Koppio	*	4	1
Kringin	*	10	7
Kulkawirra	†	11	8
Kyancutta	†	4	1
Kybybolite	*	6	3
Kybybolite Women's	1418	4	—
Lameroo	*	1	5
Langhorne's Creek	1444	5	2
Laura	*	8	5
Laura Bay	†	—	—
Lenswood and Forest Range	†	—	—
Light's Pass	1433	—	—
Lipson	*	1	5
Lone Gum and Monash	*	5	2
Lone Pine	*	3 & 31	—
Lowbank	*	5	2
Loxton	*	14	11
Lyndoch	†	4	1 & 29
McLaren Flat Women's	1419	6	3
Macclesfield	†	20	17
MacGillivray	*	4	1
Mallala	*	17	21
Maltee	†	6	3
Mangalo	†	—	—
Mangalo Women's	1419	—	—
Marama	†	—	—
Meadows	*	5	2
Meribah	*	10	14
Milang	1446	8	12
Millicent	*	28	25

INDEX TO BUREAU REPORTS—*continued*.

Branch.	Report on Page.	Dates of Meetings.		Branch.	Report on Page.	Dates of Meetings.	
		July.	Aug.			July.	Aug.
Millicent Women's	1421	—	—	Rudall	*	4	1
Miltalie	1436	1	5	Saddleworth	*	7	4
Mindarie	*	7	4	Saddleworth Women's	†	4	1
Monarto South	1439	—	—	Scott's Bottom	*	1	5
Moorlands	†	—	9	Shoal Bay	*	4	1
Morchard	†	7	4	Smoky Bay	†	14	11
Morchard Womens'	†	—	—	Snowtown	†	—	—
Mount Barker	*	17	21	South Kilkerran	*	4	1
Mount Compass	†	6	3	Springton	*	5	2
Mount Gambier	†	14	11	Stanley Flat	*	17	21
Mount Hope	1437	4	1	Strathalbyn	†	12	9
Mount Pleasant	1447	—	—	Streaky Bay	*	28	25
Mudamuckla	†	8	12	Sutherlands	†	6	3
Mundalla	†	—	—	Tailem Bend	*	13	10
Mundalla Women's	1422	6	3	Talia	*	28	25
Murraytown	*	—	—	Tantanoola	†	1	5
Mypolonga	*	12	2	Tantanoola Women's	1424	5	2
Myponga	*	20	17	Taplan	*	4	1
Myrla	*	5	2	Taragoro	1438	6	3
Nantawarra	*	4	3	Tarlee	*	11	8
Naracoorte	*	8	12	Truro	†	18	21
Nelshaby	1428		—	Tulkineara	*	6	3
Netherton	*	5	2	Tweedvale	*	20	17
Nunjikompita	*	6	3	Ungarra	*	13	10
Nunkeri	†	5	2	Upper Wakefield	†	6	3 & 31
O'Loughlin	†	10	14	Uraidla and Summer-	*		
Overland Corner	1442	5	2	town	*	3	7
Owen	*	7	4	Waddikee Rocks	*	1	5
Palabie	†	—	—	Waikerie	*	14	11
Parilla	*	25	—	Wallala	*	12	9
Parilla Women's	†	19	16	Wanbi	*	26	23
Parilla Well	*	18	15	Wandearah	*	4	1
Parilla Well Women's	*	18	15	Warcowie	†	4	1
Parrakie Women's	†	18	22	Warcowie Women's	†	4	1
Paruna	*	7	4	Warramboo	*	4	8
Paskeville	*	4	1	Warramboo Women's	†	—	—
Pata	*	7	4	Wasleys	†	13	10
Penola	*	1	5	Wasleys Women's	1425	6	3
Penola Women's	1422	—	—	Watervale	*	17	21
Penwortham	†	6	3	Wauraltee	*	4	1
Petersville	*	4	1	Weavers	*	10	14
Petina	*	22	26	Wepowie	1428	3 & 31	—
Pinbong	†	—	—	Williamstown	*		
Pinnaroo	1440	—	—	Women's	1426	5	2
Pinnaroo Women's	1423	7	4	Willowie	*	24	28
Port Elliot	*	15	—	Wilmington	†	11	15
Pygery	†	4	1	Wirrilla	*	1	5
Pygery Women's	1423	—	—	Wirrilla Women's	*	6	3
Ramco	†	3 & 31	—	Wirrulla	*	19	16
Redhill	1430	4	—	Wolseley	*	10	14
Rendelsham	†	1	5	Wudinna	†	—	—
Rendelsham Women's	1424	—	—	Yadnarie	†	4	1
Riverton	*	10	14	Yandiah	*	—	11
Roberts & Verran	†	—	—	Yaninee	*	—	—
Rosedale	†	—	—	Yeelanna	*	5	2
Roseworthy	*	—	—	Yurgo Women's	1426	—	—

* No reports received during the month of June.

† Held over. R In recess.

AGRICULTURAL BUREAU OF SOUTH AUSTRALIA

Every producer should be a member of the Agricultural Bureau. A postcard to the Department of Agriculture will bring information as to the name and address of the Secretary of the nearest Branch.

If the nearest Branch is too far from the reader's home, the opportunity occurs to form a new one. Write to the Department for fuller particulars concerning the work of this institution.

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The subscription for all other members is 2s. 6d., commencing from August 1st in each year, provided that—subject to the above exemptions—nominations forwarded during the months of January to June must be accompanied by a payment of 1s. 6d. each nomination for that period.]

WOMEN'S BRANCHES.

KYBYBOLITE (Average annual rainfall, 22in.).

April 4th.—Attendance, 17.

Jam Making and Fruit Preserving.—Mrs. S. Shepherd read the following paper:—"All jams may be made either from fresh fruit or from pulp, but fresh fruit is preferable. Best results are obtained by using ripe sound fruit and slightly under-ripe fruit in equal proportions. The ripe fruit provides good color and flavor, the unripe fruit supplies the pectin found in most fruit. Pectin is the jellying property, and is present in some fruit more than in others. Melons, for instance, have not much pectin, neither have raspberries, while in red currants pectin is plentiful. In some other fruits, such as quinces, it does not easily come into solution, because there is not sufficient acid in the fruit. In this case the addition of lemon juice is beneficial. The pectin is not properly developed in fruit that is under-ripe, while in over-ripe fruit it disappears altogether. The best stage, then, for jam or jelly making is when the fruit is fully grown and just before it ripens. Berry fruits, such as raspberry, loganberry, &c., require a rapid boiling after the sugar has been added in order to secure a good flavor, and a good light bright color. The longer jam is boiled the darker it becomes. Quinces, pears, and apples require a more gentle boiling in order to gain a rich red color. Brewers' crystals or white granulated sugar is best for jam making. The usual quantity of sugar used is from ¾lb. to 1lb. of fruit—nothing less than half at any time, because the jam will not keep. Acid fruits require equal quantities of sugar to fruit. If one thoroughly dissolves the sugar before the jam comes to the boil again, it does not crystalise later on, when stored for some length of time. Also one has to skim the jam, but if I add 1 tablespoonful of butter, just as the jam is coming to boil again after adding the sugar, I do not have to skim at all. I add 1 tablespoonful of butter to each 16lb. of fruit. In making fig jam, add 2 tablespoonfuls of vinegar. This will stop mould, which is very common in fig jam. There are several ways of making jam. One is by cooking the fruit in water or its own juice slowly until tender and then to add sugar and boil rapidly until the test shows that it is cooked. This may be used with quinces, dried apricots, plums, &c. Another method is to make a syrup of sugar and water, or sugar and fruit juice, and then add the fruit. Another is to add sugar to the fruit and put it on to boil. Often with peaches, apricots, and pineapple the sugar is put on the fruit over night. Allow the jam to cool before bottling, then bottle and let it stand until cold. Then paste down with a piece of paper. I always use very thin brown paper and put paste on both sides, making it airtight when dry. I make the paste by using a little flour mixed with cold water and then cooked with boiling water. I sometimes use white wax, then I do not always paste down. *Preserving.*—It is a great boon to the housewife to have a good supply of fruit, such as preserved and dried, for winter use. By doing this one has to be ready for bottling fruits as they come into season. Take the fruits intended for bottling. Wash and grade out any that have grubs in or bruised spots on them. To prepare the fruit, if apricot, cut in halves, take out stones, pack into bottles cut side down, and pack as tightly as possible. Fill up the bottles with cold water or syrup; the bottles should be quite full—within half an inch of the top. The water or syrup should be poured into the bottles slowly, so that the air may escape from the bottles, otherwise after sterilisation some of the fruit at the top will not be covered with liquid and will discolor. The syrup can be prepared by boiling sugar and water together. I never make a syrup, but put the sugar and water on the fruit; put on a rubber ring, lid, and clip, and put into steriliser and bring slowly to the degrees stated. I allow 5 dessertspoonfuls of sugar to 1 of the No. 36 Fowler's bottles. If the syrup is too heavy, the fruit rises to the top. Be very careful when putting on the rubber rings to see that they are not twisted, otherwise they will not seal airtight. When bottling bananas alone they are scarcely worth bottling, because they lose their flavor and turn very milky in appearance; but if sliced and mixed with pineapple, peaches, apricots, cherries, plums, or any other fruits and made into a fruit salad it is then a very satisfactory addition. Another cause why fruit rises to the top is because it is overripe. If one has a Fowler's outfit and reads the instructions carefully, there should not be any trouble with bottling fruit.'' (Secretary, Mrs. W. Kekwick.)

MANGALO (Average annual rainfall, 14in. to 15in.).

May 10th.—Attendance, 12.

JAM MAKING RECIPES.—Mrs. W. Munday read the following paper:—''The best results are obtained by boiling the fruit half an hour before adding the sugar. Very few fruits need the addition of water. After the sugar has been added boil it hard until cooked. Plum jam needs ¾ to 1 hour boiling after the sugar has been added. Prolonged boiling with the sugar has the effect of partly and sometimes wholly destroying the jellying properties of the fruit. Lengthy boiling of sugar also darkens the color of the jam and spoils the taste. *Pineapple and Melon Jam*: 9lbs. melon, 1 tin pineapple, 6½lbs. sugar, 2 teaspoons acid; make a syrup of sugar and pineapple juice, then add pineapple and melon cut up small, and boil about 3 hours; add 1 teaspoon of pineapple essence when cool. *Tomato Sauce*: 8lbs. tomatoes, ¼lb. salt, 2lbs. brown or white sugar, 1qt. vinegar, 1oz. pepper, ¼oz. allspice, 1oz. cloves, 6 large onions, 3 or 4 apples; boil for 3 hours, strain, and bottle while hot. *Dripping Cake* (Mrs. P Cleave): 1½ cups sugar, ¾ cup dripping, 1 cup milk, 2 eggs, ½ cup currants, ½ cup raisins, 1 piece lemon peel, 3 cups flour, 1 teaspoon soda, 2 teaspoons tartar. Method—Mix sugar and eggs then milk; dissolve dripping and carb. soda with boiling water and add to the mixture; sift cream tartar and flour and add currants, raisins, and lemon peel with flour; then mix all together. The mixture must be rather soft, if too stiff, add boiling water. Bake ½ hour. *Green Tomato Sauce* (Mrs. B. Coles): 6lbs. green tomatoes, 2 large onions, 2lbs. brown sugar, 5ozs. salt, 2ozs. pepper corns, ½oz. cloves, ¼oz. allspice (tie pepper corns, &c., in muslin bag), 1½pts. vinegar; put all in preserving pan and boil 2 hours; rub through sieve and bottle. This sauce can be used for browning gravies and stews and flavoring dishes.'' (Secretary, Mrs. B. Coles.)

McLAREN FLAT.

May 3rd.—Attendance, 16.

HOME NURSING.—Paper read by Mrs. K. Warren:—''The doctors of the old school depended almost entirely upon the administration of drugs in treatment of disease, but the modern practitioner regards drugging with growing disfavor. The open-air treatment of consumption has revolutionised the treatment not only of consumption, but of many other diseases. Typhoid fever, pneumonia, and a large number of other diseases that were formerly treated almost exclusively by drugging are now treated almost entirely by other means. Physicians have long recognised that as a class drugs are unsatisfactory remedies. In many cases a drug which acts favorably in the relief of certain distressing symptoms provokes other symptoms which are quite as unpleasant and perhaps more serious. Thus the coal-tar products, acetanilide and phenacetin, are frequently prescribed for the relief of headache. The coal-tar remedies are notorious heart depressants. Morphia and other nerve sedatives relieve pain, not by removing the cause of the disease, but by paralysing temporarily the nerves that convey the sensations of pain. It is quite different with the administration of water treatments. The fomentation, or, alternate hot and cold compress, frequently relieves pain, not by benumbing the sensibilities, but by controlling the inflammation which causes the pain. The cold bath or the cooling wet sheet pack reduces fever, not by depressing the heart and other vital organs, as in the case of certain fever-reducing drugs, but through the natural physical processes of heat radiation and elimination. Other examples may be mentioned, but these are sufficient to illustrate the superiority of simple procedures over drugs in the treatment of many common diseases and ailments, while there are many drugs which may, under the direction of the physician, be advantageously employed in the treatment of disease. Beyond a doubt the majority have profound confidence in any drug prescribed by a doctor, while they regard very dubiously the advice to employ a graduated bath or wet sheet pack. The word 'health' comes from the Anglo-Saxon word meaning 'whole.' Health may be defined as a condition in which all the bodily organs perform their function harmoniously. Disease is a condition of discord in which one or more organs are disturbed; in fact, seldom, if ever, is but one organ disordered, for the body, though composed of many members, is a unit. Its various parts are so closely related that if one member suffers, all suffer to a greater or less degree. The fluid that bathes and unifies the various structures of the body is called blood. The blood is truly called the 'life,' because it carries oxygen and food, the elements of life, to each tiny cell in the body. It further collects the poisonous waste materials thrown off by countless cells and conveys them to the various eliminative organs for excretion. The simple treatments which follow are based upon the fact that by the use of water at various temperatures it is possible, to a large extent to control the flow of blood through any portion of the body. In order that these treatments may be understood, it is necessary to explain briefly the effects of heat and cold upon the body. A brief application of cold to the skin causes momentary closure or contraction of the superficial blood vessels, followed promptly by dilation and an increased flow of blood through them. A hot application to the skin produces first a contraction of both superficial and deep blood vessels, followed almost immediately by dilation and reddening of the skin. By alternate hot and cold applications, the circulation of the blood in any portion of the body may be remarkably increased. The hot application, which should continue for about two minutes, causes dilation of the blood vessels with a consequent inrush of blood to fill them; a cold application of 10 to 20 seconds' duration is then made, which contracts, thus causing a pumping process, increasing the flow of blood throughout the part. Prolonged local applications of cold are useful in controlling certain acute inflammations in the early stage. Thus, if very cold compresses are applied continuously for several hours to a developing boil, its progress may be arrested. If the boil has already begun to soften—an occurrence indicative of pus formation—it is useless to employ a cold compress. In such a case hot foments should be applied, because they hasten the formation of pus and so facilitate recovery. By a hot compress or fomentation is meant a local application to the skin of moist heat, by means of cloths wrung out in very hot water. This treatment serves a number of purposes, according to the mode of administration. It may be used to relieve pain, to draw away stagnant blood from a congested part, or to increase the flow of blood. To administer a foment, have the boiling water near patient, fold a piece of flannel two or three times, and place in a second piece of linen in a vessel. The ends of the second piece should hang over the sides of the vessel employed, as it acts as a wringer; the ends should be kept dry so as not to burn the hands. Pour on boiling water, and allow the flannel to become thoroughly saturated; gather up opposite ends of the wringer and twist to squeeze out surplus moisture. Shake a second before applying—the steam is apt to burn—then apply gradually. The fomentation should cover a larger area than the part affected. Hot sponging to the spine of a restless patient often induces sleep. The soda sponge is often employed for the relief of itching, as in hives or insect bites. Tepid sponging will reduce high temperatures. The immersion of both hands in very cold water sometimes arrests obstinate bleeding from the nose. In treatment of chilblains nothing is more effective than alternate hot and cold baths. Many do not realise the value of common household salt in home nursing. As a gargle to keep the throat and mouth healthy, it is excellent, because the germs of many infectious diseases are found in the throat and nose. No gargle will kill the germs once they are there, but regular gargling will keep the throat healthy and clean. The salt bath for any infected or poisoned wound is very largely used in the medical world to-day. The affected part is immersed in the hot saline bath and kept at an even temperature for some time. This done at two-hourly intervals, followed by a hot fomentation and the injured part covered with oiled silk, to retain heat, then bound up with cotton wool, will often save a visit to the doctor."

RECIPES.—*Apple Slice* (Miss F. Bell): 1lb. S.R. flour, ¼lb. sugar, ¼lb. butter, 1 egg, pinch salt, little lemon juice, 1 tablespoonful water, 1lb. stewed apples. *Method*—Sift flour with sugar and salt, beat egg, add lemon juice and water, rub butter into flour, add liquid to make a stiff dough, roll out ¼in. thick, divide in two parts. Cover one half with stewed apples and cover with other half. Brush over with water and sprinkle with sugar and cinnamon. Bake 20 to 30 minutes. *Apple Tart* (Mrs. Bert Elliott): 3ozs. each of cream, butter, and sugar, add 1 egg, then ½lb. S.R. flour, roll out, and line tart plates. Bake in a moderate oven. When cold, fill with stewed apples which have been cooked as dry as possible. Decorate top with whipped cream. *Apple Snow* (Mrs. C. Oakley): Put on to stew two large cooking apples, ½ cup sugar (or sweeten to taste). When well mashed, stand aside to cool, add the well-beaten white of large egg or two small eggs, beat both together, and pour into dish. Do not smooth top. Sprinkle with desiccated cocoanut, set aside a few hours to cool, and serve with egg custard. Pour off any liquid that separates from apple before putting in whites of eggs. *Apple Tarts* (Mrs. S. Elliott): 6ozs. flour, ½ teaspoonful baking powder, little salt, yolk of one egg, two tablespoonfuls water, little lemon juice, 4ozs. shortening, ¼lb. butter, and ¼lb. dripping. Cut pastry with cutter and place in pattypans, then a teaspoonful of apple, then beat the white of one egg with tablespoonful sugar, 1 tablespoonful cocoanut, and place on top of apples, then bake. *Apple Tart* (Mrs. B. Powell and Mrs. E. Air): Have ready lined with puff pastry or shortcrust two plates. Take 3 apples, peel and core, squeeze juice of 1 lemon, grate rind of ½ lemon, add sugar to taste, and stir well; break 2 eggs into a basin with 1 tablespoonful sugar, beat well as for a sponge, pour into apple mixture and stir well. Pour into lined plates and dot a few pieces of butter over it. *Apple Fritters* (Miss R. Elliott): Take 4 tablespoonfuls S.R. flour, 2 eggs, and little new milk. Make a stiff batter, beat well, and stand five minutes. Pare and core apples, cut into rings, roll in sugar, dip into batter, and fry in plenty of boiling fat. (Secretary, Mrs. B. Elliott.)

MILLICENT (Average annual rainfall, 29.76in.).

April 21st.—Attendance, 8.

Papers on "Literature in the Home" were read by Mesdames Hutchesson, Oberlander, and Varcoe, each writer giving a list of books suitable for reading for both young and old. (Secretary, Mrs. M. Hutchesson.)

May 19th.—Attendance, 16.

Biscuit Recipes.—(Mrs. Hutchesson) *Jam Drops*: 2 cups flour, 1 teaspoonful cream tartar, ½ teaspoon soda, ¾ cup sugar, ½ cup butter, 2 eggs; beat butter and sugar to a cream, add eggs and beat well; then add flour and roll into balls with the hands; make

1933 CALENDAR 1933

JANUARY

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1934 CALENDAR 1934

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hole in centre and put in jam; bake in quick oven for 15 minutes. ***Munchies***: 1 cup each flour, rolled oats, sugar, cocoanut, ¼lb. butter, 1 tablespoon golden syrup, 1 small teaspoonful of soda, 2 tablespoons water; mix dry ingredients together, melt butter and golden syrup, then add water in which the soda has been dissolved; mix and drop a teaspoonful on slide and bake in moderate oven until golden brown. (Mrs. Ey) ***Cockles***: 3 eggs, their weight in flour, cornflour, sugar, and butter, and 1 teaspoon c. tartar and ½ teaspoon soda; beat butter and sugar, add dry ingredients (mixed); drop in spoonfuls on a slide then place two together; ice. *Vanilla Biscuits*: 4ozs. flour, 2ozs. sugar, yolk 1 egg, ¼ teaspoon vanilla essence, 2ozs. butter, ¼ teaspoon baking powder; cream butter and sugar, add yolk and beat well, then add vanilla, then sifted flour and baking powder; put through biscuit forcer and bake until a light brown. (Mrs. Sullivan) *Raisin Biscuits*: 1 cup flour, ½ cup each cornflour or maizena, butter, sugar, pinch of salt, 1 egg and 2 tablespoons milk; sift flour, rub in butter and sugar; mix beaten egg and milk together and add slowly to flour, using just enough to make a stiff dough; roll out and cut in slices; bake in moderate oven 15 minutes; when cold, put together with filling between, and ice top. Filling—¼lb. seeded raisins and 1oz. of almonds or walnuts made into a paste with lemon or orange juice. *Cocoanut Fingers*: Rub ¼lb. butter, 3ozs. sugar, ½lb. flour, and ½ teaspoon soda, and 1 teaspoon of c. tartar together; then add 1 tablespoon of desiccated cocoanut; mix with 1 egg (well beaten); roll and cut; dip in milk and then cocoanut. (Mrs. L. R. Elton) *Arrowroot Biscuits*: Take 1½ cups flour, ½ cup arrowroot, ¾ cup sugar, 3 tablespoons butter or dripping, ¾ teaspoon soda, 1½ teaspoons c. tartar, essence if liked, and 1 or 2 eggs well beaten, to which has been added enough water or milk to make about ¾ cup; sift flour, arrowroot, soda, and c. tartar; add sugar; rub in butter; form into a stiff dough with egg and milk or water, roll out and cut into shape; bake about 10 or 15 minutes in a brisk oven. (Mrs. A. Cassels) *Champagne Biscuits*: 2 cups flour, 1 cup sugar, ¼lb. shortening, 1 teaspoon c. tartar, ½ teaspoon soda, 1 egg, 1 tablespoon milk; beat egg with sugar, add milk, rub shortening into flour, mix to a stiff dough; bake 10 minutes. *Date Slices*: Mash some stoned dates, add a little boiling water; spread between layers of champagne biscuit dough and cut into fingers. *Cinnamon Rolls*: Roll out a long strip of biscuit dough, about 4in. wide, spread lightly with jam and dust with cinnamon; roll up and cut into pieces about ¾in. in length. (Mrs. H. W. Altschwager) *Champagne Biscuits*: 2 cups flour, 1 cup sugar, 1 cup butter, 2 eggs, ½ teaspoon carb. soda, 1 teaspoon c. tartar, 2 tablespoons milk or more if required; bake 10 to 15 minutes. *Belgian Biscuits*: 1 cup flour, 2 ozs. butter, 1½ozs. castor sugar, yolk of 1 egg, ⅛ teaspoon cinnamon or nutmeg; cream butter and sugar until soft, then add egg yolk; stir in flour and spice and knead by hand until well mixed; roll out thin, put on greased slide; bake 10 minutes in a moderate oven; when cold, put jam between two, and if liked, ice the top. *Ammonia Biscuits*: 1lb. flour, ½lb. sugar, ¼lb. butter, ¼oz. ammonia dissolved in ½ cup hot milk. (Secretary, Mrs. M. Hutchesson.)

MUNDALLA (Average annual rainfall, 23.04in.).

May 12th.—Attendance, 11.

Mrs. Golding gave a demonstration of re-footing a stocking. Hints on knitting woollen goods were also freely passed on from one member to another. *Ginger Sponge* (Miss K. Hillier): ¼lb. butter, 1 cup sugar, 3 eggs, 1 cup flour, 1 teaspoon c. tartar, and ½ teaspoon carb. soda, 2 teaspoons cinnamon, 2 teaspoons ginger, ½ cup milk; beat butter and sugar to a cream, add eggs well beaten, then ginger, cinnamon, soda, c. tartar, and milk; bake 25 minutes in a moderate oven. (Secretary, Miss K. Hillier.)

PENOLA (Average annual rainfall, 26.06in.).

May 3rd.—Attendance, 19.

QUESTION BOX.—The meeting took the form of a Question Box:—How to obtain bright gloss on collars? *Answer*: Mix starch overnight, and when required add 1 teaspoonful each of turpentine and borax. How to prevent paper from sticking to cakes? *Answer*: Use dripping that does not contain salt. An excellent preventive used by factories is vegetable oil. What causes cakes to sink in centre when almost done? *Answer*: Opening oven door too soon, an unbalanced mixture, too much butter, sugar, etc., too hot an oven or too cold, moving cake, kettle cold water on stove. How to remove stains from glass that has contained well water? *Answer*: Use eggshells, raw potatoes, or rice with a little water, shake well. How to prepare feathers for use? *Answer*: Put in oven until thoroughly heated, scald in hot water and dry. Recipe for cake containing dripping:—*Biscuits.*—1 cup dripping, 1 cup sugar, ¼ cup boiling water. Mix ingredients together, add 1 egg, 3 cups flour, 2 teaspoonfuls cream tartar, 1 carbonate soda, and a pinch salt. These biscuits may be joined together with jam or icing. *Cake.*—4 cups S.R. flour, 1½ cups sugar, 1 cup dripping, 1 cup fruit, 2 eggs, and sufficient milk to mix; 1 tablespoonful honey or golden syrup will improve cake and will keep cake fresh much longer. One or two more eggs are an improvement, but not necessary. (Secretary, Mrs. E. Kidman.)

PINNAROO (Average annual rainfall, 14.54in.).

April 21st.—All members and large attendance of visitors.

Cooking and Flower Competition.—The first cooking and flower show held under the auspices of the Branch attracted 130 entries. The exhibition was opened by Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau), and the entries were judged by Mesdames Phillis and Welden and Miss Colwill of the Parilla Women's Branch. The following is a list of the first prize winners:—*Cooking*—Loaf of bread, Mrs. Ahrns; yeast buns (six), Mrs. Longford; German yeast cake, Mrs. Ahrns; scones (six), Mrs. McCabe; scones (wholemeal, six), Mrs. Pearce; coffee cake, Mrs. Hawthorne; sponge roll, Mrs. Gilbert; sponge sandwich, Mrs. Longford; chocolate sponge, Mrs. Pearce; collection of pastry, Mrs. Fewings; jam tarts (six), Mrs. Fewings; cream puffs (six), Mrs. Hill; collection of biscuits, Mrs. Fewings; fruit cake, Mrs. Young; currant cake, Mrs. Stevens; Sultana cake, Mrs. Hawthorne; seed cake, Mrs. Longford; collection of small cakes, Mrs. N. O. Loughlin; plate of sandwiches, Mrs. Bennetts. *Jams, Pickles, and Preserves*—Pickles (three varieties), Mrs. Atze; tomato sauce, Mrs. Atze; chutney (three varieties), Mrs. Fewings; jam (three varieties), Mrs. Hawthorne; jelly (three varieties), Mrs. Gray; marmalade, Mrs. Bonnin; preserved fruit (three varieties), Mrs. Bonnin. *Flowers*—Bowl of dahlias, Mrs. Atze; bowl of chrysanthemums, Mrs. Atze; vase of cosmos, Mrs. Fewings; vase of perennial aster, Mrs. Fewings; vase of gallardia, Mrs. Fisk; roses (three), Mrs. Wood. (Secretary, Mrs. F. Atze.)

PYGERY.

April 11th.—Attendance, 7.

Cookery Display and Recipes.—Miss O. Ingram: *Cinnamon Sponge.*—Beat together ¼lb. butter, ½lb. sugar, add 3 eggs, ½ cup of milk, 4 teaspoonfuls cinnamon, ½lb. flour, 1 teaspoonful carbonate of soda, 2 teaspoonfuls cream of tartar. Mrs. Woodrup: *Sponge Cake.*—4 eggs, ¾ cup sugar, ½ cup cornflour; beat eggs and sugar 10 minutes and add 1 teaspoonful carbonate of soda, 2 teaspoonfuls cream of tartar in cornflour. *Rusks.*—½lb. flour, 2ozs. or 3 ozs. butter, 1 teaspoonful baking powder, 1 egg; rub butter into flour and mix in egg. Roll out and cut with a cutter. Bake until brown. Cut in halves and bake until crisp. Eat with butter or cheese. *Honey Biscuits.*—2lbs. each honey and sugar, 1lb. dripping, 4 eggs, 2 large teaspoonfuls potash, 1 teaspoonful carbonate of soda, and enough flour to make stiff dough. Bake in a slow oven. *Iced Currant Fingers.*—¼lb. butter, 2ozs. sugar, ½lb. flour, little salt, ½ teaspoonful baking powder, 1 egg, 1 tablespoonful milk, 2ozs. to 4ozs. currants. Rub butter into flour and currants, mix with milk and egg (yolk only); roll out and spread with icing made with white of egg and 4ozs. icing sugar. Cut in fingers and bake. *Melting Moments.*—Beat 6ozs. butter to a cream, add 3ozs. castor sugar, ½lb. cornflour, 2 eggs well beaten, add 1 heaped teaspoonful baking powder. Beat all together and drop about a teaspoonful of the mixture into pattypans. Bake 20 minutes in medium oven. *Almond Biscuits.*—6ozs. butter, 7 tablespoonfuls flour, 2 tablespoonfuls each icing sugar and cornflour, 2 ozs. ground almonds. Cream butter, add icing sugar, and beat well; add cornflour and sifted flour. Force through a biscuit forcer on to a greased slide. Bake in a moderate oven for 15 minutes. Stick together with jam or icing. *Crackers.*—Rub 2 tablespoonfuls of butter into 2 cups of plain flour and 1 teaspoonful salt. Mix stiff with a little milk. Roll out very thin and bake in a hot oven. *Cream Biscuits.*—3 cups flour, 3 eggs, 2 tablespoonfuls cream, 2 tablespoonfuls cream of tartar, 1 of carbonate of soda, a little milk. Roll out thin and cut into shapes. Bake until brown and decorate with glaciated cherries. Mrs. M. E. Heath: *Cheese Straws.*—6ozs. plain flour, pinch of salt, pinch of cayenne pepper, 4ozs. each butter and grated cheese, whites of 2 eggs and a little water. Rub butter into flour, then cheese, salt and pepper, and mix stiffly with eggs and water. Roll out and cut into fingers; cook in moderate oven. *Ginger Nuts.*—1lb. plain flour, ½lb. treacle, ¼lb. butter, ½oz. ground ginger, cinnamon to taste, 1 teaspoonful carbonate of soda, ½ teaspoonful salt, 3ozs. dark sugar, 2 tablespoonfuls milk. Put flour, salt, ginger, spice, sugar and soda into a basin and mix with milk. Melt treacle and butter and mix and roll out. Bake quarter of an hour. *Cocoaroons.*—White of 2eggs, 1 cup of sugar. Beat until very stiff, then add 2 cups cornflakes, 1 cup of cocoanut, 1 teaspoonful cornflour. Put on slide in pyramids and bake in moderate oven. *Cockles.*—¼lb. each butter, S.R. flour, cornflour, and sugar and 2 eggs. Cream butter and sugar, then beat eggs well and sift cornflour into mixture. Put 1 teaspoonful at a time on cool tray and bake in brisk oven. Miss R. V. Foster: *Sultana Cake.*—10ozs. flour, 8ozs. each butter, sugar, and sultanas, ¼lb. lemon peel, 5 eggs, nutmeg, and essence lemon. Beat butter and sugar together, add well-beaten eggs, then dry ingredients, and bake for 1½ hours in a slow oven. *Cocoanut Biscuits.*—5ozs. flour, 3ozs. each sugar and butter, ½ teaspoonful carbonate soda, 1 egg, 2 tablespoonfuls desiccated cocoanut; rub butter and sugar together, then the beaten egg, then flour, soda, and cocoanut. When thoroughly mixed place very small pieces on a floured slide and bake about 10 minutes. *Shortbread Fingers.*—1lb. of flour, ¼lb. (or less according to taste) white sugar, ½lb. of butter, 2 tablespoonfuls water. Rub butter and sugar well together, mix water, and shake in flour gradually. Rub all together, roll out on a board, and cut into fingers. Bake in quick oven until light brown on both sides, having turned them over once. Mrs. W. H. Douglass: *Coffee Cake.*—Cream together ½lb. butter, 1½ cups sugar, beat in 4 eggs, add small cup of milk, 3 cups of flour, 1 teaspoonful carbonate of soda, and 2 teaspoonfuls cream of tartar. *Fruit Coffee Cake.*—1 cup of butter, 1½ cups sugar creamed together, add 4 eggs beaten, 1 cup milk, 2 tablespoonfuls treacle, 1 teaspoonful cinnamon, 3 cups flour, 1 teaspoonful carbonate of soda and 2 teaspoonfuls cream of tartar. *Ginger Sandwich.*—Cream together 2 tablespoonfuls butter, ½ cup sugar, beat in 1 egg; add ½ cup milk, ½ cup treacle, 1 teaspoonful ginger, 1 teaspoonful cinnamon, 1 cup plain flour, add lastly and dissolve 1 teaspoonful carbonate soda in a little hot water. (Secretary, Miss I. Heylen.)

RENDELSHAM.

May 3rd.—Attendance, 13.

Butter Making.—Mrs. F. White read the following paper:—"First everything used in connection with butter must be scrupulously clean. First-quality cream is necessary for the production of good butter. Cream should be separated to the consistency of honey, a little salt added, and the cream well stirred each day. Never run warm cream into cold cream. Scald the churn with boiling water for a minute or so and then rinse with cold water. The churn must be scalded in hot weather, but made as cool as possible after scalding. Even then the butter is sometimes inclined to become spongy, and it is difficult to remove the buttermilk. Salt may be added with cream in the churn in the proportion of 1 tablespoonful of salt to the pound; done in this way the salt will not come through the butter, but the buttermilk is spoiled for use afterwards. Another method is to add salt in the form of brine. After keeping the cream well scraped from the lid and sides of the churn to ensure even churning and to prevent streaks in butter—when it is at the stage of small butter grains, before amalgamating too much—add the brine for salting, which is made by combining 6 tablespoonfuls of salt with 2 cups of water—this should salt 6lb. of butter. After adding this at the "graining" stage, wash out in the usual way until clean. Butter will be sufficiently salted in this way. If done in this way with brine, the water clears quicker than in the ordinary method of working." (Secretary, Mrs. E. Andrews.)

TANTANOOLA.

April 12th.—Attendance, 7.

Household Soap.—Mrs. Froth exhibited samples of home-made soap and read the following paper:—"It is more economical to use home-made soap than to buy it, especially on farms where fat is plentiful. Make the soap on Mondays, after washing, and then fill the copper with water, which can be used for washing floors during the week. For best results clean fat, free from salt, is necessary. If the fat is not clean, boil it in plenty of water and add a piece of washing soda. When it has set, take it out of the water and scrape the bottom, repeat this until it is clean. A very useful sand soap can be made by adding equal parts of fine, clean sand and ashes, and a little extra water. Always watch the soap very closely, but do not stir too much; this causes a lather to rise which remains on the soap when it sets. Make the soap about a month before it will be needed, to allow it to harden. A tablespoon of Glauber salts may be added last of all to keep the soap from shrinking. Lux and borax may be used also, and is an improvement in soap for washing clothes, but for general household work such as dishes, floors, &c., this is not necessary. Greenbank caustic soda is preferable to any other brand. A cup of petrol added to laundry soap helps to preserve the colors in garments and whiten plain clothes. Always have cold water handy, because soap boils over very quickly. If the resin is lumpy, turn it on to a cloth or paper and roll with a bottle. *Ingredients*—7lbs. fat, 2galls. water, ¾lb. resin, 1 tin greenbank caustic soda, and 1 cup petrol. *Method*—Put 1gall. of water in a kerosene tin and bring to the boil, then add the other gallon of water—this brings the water to the correct temperature—then add the fat, then the resin, and the caustic very gently. Bring to the boil very slowly and boil for 1 hour. Remove from the fire and leave about 1 hour or longer, then add 1 cup of petrol and mix well. Leave over night to set. This recipe is left in the tin to set. Next day just remove the handle and with a knife move the soap from the sides of the tin, pour a little water around and the soap will come out quite easily. *Recipe No. 2*—*Ingredients*—5lbs. fat, 1lb. resin, 1 tin caustic soda, and 10 pints water. *Method*—Place water, fat, and resin in the copper, bring to the boil and simmer gently until resin is dissolved. Then add caustic and cook until it strings from the stick. The hot soap should be about the consistency of honey. Take from the fire and turn into a large vessel to set. Next day cut into bars and store to harden. For washing clothes the first recipe is preferred.''

May 3rd.—Attendance, 10.

Washing and Ironing Hints.—Miss J. Telfer read the following paper:—''Washing day is looked upon as a day of drudgery to most women. When copper is boiling, take out enough water to wash the dirtiest of the hand towels and put white clothes on to boil, such as sheets, pillow slips, shirts, &c., and if the tea towels are not too dirty they may also be added to the first boil. When clothes have been boiling 20 minutes they can be taken out and the hand towels may be put in with a little more soap to boil. Put whites into clean, cold water, rinse, then put into another water, rinse and put into the blue, then wring out and hang on line. Towels by that time should be boiled enough to be taken out. Put them through the same waters as the white clothes. The lightest of the coloreds are next which are washed out; put into two rinse waters, but not in the blue. The darkest colored are next, then the darks, such as trousers, skirts, socks, &c., trousers that have grease marks on them. A little kerosene applied to the stain and rubbed between the hands will help to remove grease. A little soap added to the blue water will prevent the clothes from getting streaked. A cup of milk or lux will soften hard water. On no account boil prints, because they are likely to fade with continual boiling. Dyes can be made fast in coloreds if first put in water to which a handful of salt has been added. When making starch, a teaspoon of salt is a great improvement. Pure muslins, voiles, linens, and organdies must never be starched. A basket on wheels or an old discarded pram are convenient methods for conveying clothes to the line. Tablecloths and sheets should be pegged hem to hem, they will then keep their shape and corners will not fray in boisterous weather. Quilts should not be wrung, but lifted from the blue and hung on the line inside out. Silks, flannels, cream materials, and light stockings should be washed in lux and not left to soak. Squeeze out the water, because wringing stretches them. A reliable rinse for silk consists of 3 parts of a bucket of water, a dash of blue, and 1 tablespoon of methylated spirits, the blue keeping the color and the spirits giving an extra gloss and firmness. Woollens must not be blued it shrinks them. In folding clothes, see that the selvidges meet and that corners are pushed out and stretched. Tablecloths should be folded so that the outer folds are formed on the side. The mangle saves much time and ironing. When damping clothes that have to be ironed, warm water is preferred, it penetrates quicker and is more evenly distributed through the clothes. Tablecloths are much easier to iron if put through the mangle first; it also improves their appearance. Fuji can be ironed wet if first put in a towel, or dried and then damped in the usual way. Embroidered linens must be ironed on the wrong side thereby raising the designs. Laces and crochet work should be pulled into shape before pressing. A washing hat is one of the most difficult things to iron, especially the crown, which is not starched. If left to dry on a basin it will be found quite a simple matter. Silks of any kind should be placed on a hanger when pressed, folding spoils the effect.'' (Secretary, Miss V. Altschwager.)

WASLEYS.

May 4th.—Attendance, 23.

The Vegetable Garden.—Miss T. Selleck contributed the following paper:—''During winter, when seed-sowing operations are to a great extent suspended, the soil should be turned over, manured, and left in a rough state in preparation for sowing. It is essential to select seeds that will do well in your district. Do not try to keep seeds from your own vegetables; they are likely to become inoculated. I usually start planting turnips and radishes in March and prefer the purple top turnip and icicle radish. For turnips dig the soil about 3in. deep and see that the bottom soil is firm. Turnips will not do well in loose soil. Do not plant too many at once; plant again in a few weeks' time. The same applies to radishes, only keep the soil loose and sow all seeds shallow, not more than ½in. deep, and on no account use artificial manure; it burns the plants, and for good vegetables it is essential to grow them quickly. Both carrots and parsnips require somewhat similar treatment. Sowings made in April will give a spring supply for the table. Deep, rich, and light loamy soil suits these plants best. The short-rooted varieties are preferred. Carrots can also be sown in August for summer use, and it is a good plan to plant swedes in April. These vegetables can be stored and are useful when other winter vegetables have stopped. If these vegetables are left too long in the ground after they mature they deteriorate. They should be lifted for storing in sand and kept in a cellar or covered with earth in the open; the same applies to carrots and parsnips. Beet can be grown practically all the year round. Sow the seeds in rows, because it is much easier to weed, thin out, and cultivate when the plants are grown in rows. In March I sow in prepared seed beds cauliflower, cabbage, and lettuce; then the plants are healthy and can be planted out in suitable weather.

Plants bought from the nursery are often rank and delicate and when planted take a long time to recover. All these plants need rich soil, and for lettuce, when they are forming hearts, work fowl manure into the soil. Keep the soil well cultivated around cauliflowers and cabbages, and should aphis appear, spray the plants continually with soapsuds. When the heads appear in cauliflowers tie the leaves together to protect them. Sow peas in May; Green Feast is the best variety to grow. Support the peas from the start, even dwarf varieties will give better returns if the plants are kept from sprawling on the ground; fruit tree prunings are useful for this purpose. Onions should be planted in June. Odorless for salads, silverskin for pickling, and white and brown Spanish for ordinary use. Shallow planting is essential, and the ground must be kept loose; ashes from the kitchen are beneficial if worked in around the plants and fowl manure when the plants are nearly full grown. Potatoes are best planted in July; frosts are too severe if planted earlier. Winter vegetables need very little water, but occasionally during dry spells watering is essential. For turnips, swedes, radishes, &c., overhead watering is successful, but lettuce, cabbages, and cauliflowers must not be watered in this manner. For early tomatoes I plant Early Dwarf, later Large Red, and for late tomatoes Ponderosa. Tomatoes do not need rich soil or a great deal of watering; this only encourages the growth of the bush and one gets less fruit, and the soil needs to be packed tightly around the plants. To ripen the early tomatoes I use sulphate of ammonia. Too much of this manure is inclined to burn the plants. When the tomatoes are setting, give liquid cow manure. Cucumbers are best sown in October. Dig a trench about 2ft. deep and put in 1ft. of stable manure, then cover with soil, plant the seeds on each side of the trench, and give abundance of water. The short prickly and apple cucumbers are the best varieties. Beans can be sown in October, and the Kentucky Wonder is a climbing variety and a good bearer. Plant in a trench and when the beans start to climb, erect netting wire about 6ft. high. Like most other summer vegetables they must have plenty of water. Trombones are best planted at the end of October. Sow the seeds in a circle, using plenty of rotted stable manure; when the bushes start to flower be careful with the water, see that the same moisture is kept; if the soil gets the least bit dry the small trombones will drop off. It is best to water them every day. It is always best to plant a rooted crop where previously there has been a leaf crop.'' (Secretary, Miss G. George.)

WILLIAMSTOWN (Average annual rainfall, 27.71in.).

June 7th.—Attendance, 5.

USES FOR POTATOES.—Mrs. Johnson read the following paper:—''A pen nib will not become rusty while not in use if it is stuck in a raw potato. A boiled potato used frequently instead of soap will keep the hands soft and white. If fat becomes burnt while frying, drop a few pieces of raw potato into it and leave for a minute or so, after which all traces of burning will have disappeared. Obstinate stains of mud can be removed from any kind of material by rinsing them in water in which potatoes have been boiled. Silk will not have a washed-out appearance after washing if it is cleaned with potato water. Paré and grate a number of potatoes into cold water and stir with a stick. Leave for an hour or so, then pour the clear portion into another vessel and wash the silk by swirling it about in the fluid. Remove without wringing and hang up to drip. When almost dry, press on the right side first to produce a gloss.'' (Secretary, Mrs. A. Cundy.)

YURGO, May 8th.

FLIES.—Miss A. Bullen read the following paper:—''The fact that flies are active agents in spreading infectious diseases is now generally recognised. A count has been made of microbes found on the bodies and legs of a number of house flies, and the average was over a million. The diseases of which flies are the most active carriers include typhoid fever, dysentry, cholera, tuberculosis, and diarrhoea, in fact large numbers of children die of diarrhoea every year. Flies lay enormous numbers of eggs, and in hot weather female flies may develop from the eggs and themselves begin laying eggs in three weeks' time. They are said to lay about 120 eggs at a time, and this five or six times during a lifetime. The eggs are laid in manure, garbage, food, &c. There is always the risk of swallowing the eggs on food. They have been known to develop into larvae in the human body and produce an inflammatory condition of the intestines, together with diarrhoea and ulceration of the mucous membrane. Moreover, flies, on coming across food that they have a preference for, such as sugar, &c., can eject that which is already in their stomachs and gorge upon the preferred food; so that a fly can feed on manure, come indoors on to food on the table, and eject its previous meal, together with all the microbes which have gathered on it. *Methods of*

Control: First of all anyone who contemplates building a house should make it fly-proof. The extra pound or two may seem a lot at the time, but the outlay would never be regretted. As flies breed in manure, people who live on farms are up against a difficult proposition in destroying their breeding grounds. One may prevent fly-breeding on one's own premises, but it is useless to the community unless all co-operate. Stables should have a concrete floor and be cleaned out daily and the manure spread thinly over the fields. The contents of latrines should be sprinkled with chloride of lime, which will kill the flies. It is judicious to empty the latrine bucket two and three times a week, burying the contents with a covering of lime. Pig buckets and garbage pails can be covered with a lid. To keep flies out of the house, wire door screens and window screens are essential. If finances prevent the use of these a good substitute for the windows is strong cheese-cloth. This, at a fair width, is obtainable at about 1s. yard; it can be tacked to the frame of the window with a small square of cardboard pressed on each tack to prevent the head tearing through. If one cannot afford a wire door the best thing to do is to keep the ordinary door shut. It is no great hardship if the windows are open. A wire door can be obtained from 12s. 6d. to 19s. 6d., according to size and quality of wood. If the fire-place is well built it is possible to seal it up with a small piece of fly-wire on top of the chimney. If not, the whole front of the fireplace can be covered in with cheesecloth drawn tightly across and nailed in the same way as the window screens. It need not be unsightly, in fact, if a design is worked in colored wools or raffia—taking care not to widen the mesh—it will add to the beauty of a room. This can be used year after year. Even with the screens at doors, windows, and fireplace, flies will still get inside almost every time the door is opened. This is especially noticeable just before a weather change, when the wind is blowing strongly on the side of the house opposite the door, and when strong-smelling foods such as onions, cabbage, &c., are cooking. The use of a spray and one of the liquid insecticides is most effective. As the beds are made and the floors swept, shut up the rooms and spray them, leaving the living room and kitchen until the housework is finished. Half an hour is ample and then windows can be opened. When it is not convenient to do this, place moistened poison-papers about. Most of these contain arsenic, and are not recommended where there are children, instead, sticky fly-papers can be used. A very effective fly-poison is made by adding 3 teaspoonfuls of formalin to 1 pint of milk or water sweetened with a little sugar. Fill a drinking glass with this solution. Take a saucer and line it with white blotting paper trimmed to the exact size of the saucer and place it bottom up over the glass. Invert quickly and place a match under the edge of the glass. As the solution evaporates from the paper more flows out from the glass and the supply is automatically renewed. Powdered insectibane dusted on window-ledges is very effective, especially for blow-flies. All food should be kept covered—there is the standing wire-safe, the hanging wire-safe, the wire dish cover, and the muslin umbrella food cover. Jugs, &c., can be covered with net covers weighted with beads. It is a good plan to keep all soiled clothes in bags, this, if several bags are used, facilitates sorting on washing day and serves a dual purpose. If the walls of the house are plastered, white-wash or color-wash them once a year, preferably in spring. If the walls are of wood or plain iron, a thorough washing with lysol will do much to discourage flies. Washing the floors with kerosene is another effective way of combating the pest, 1 cupful to a pail of water. *Recipe for Sticky Fly-papers*: Take 2lbs. resin and 1 pint of castor oil, heat together until it has the appearance of treacle. Smear while hot on any paper and place about the room.'' (Secretary, Mrs. R. E. Sanders.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Gladstone	9/6/33	23	Address—Miss Dixon ...	Miss M .Sargent
Rendelsham....	8/6/33	130	Annual Social	Mrs. Edwards
Coonawarra ...	21/6/33	13	" Pruning," H. H. Orchard	Mrs. F. Skinner
Clare	3/6/33	21	Address—E. H. Pryor ...	Mrs. A. Rogers
Saddleworth ...	6/6/33	14	Address—Sister Coleman .	Miss G. Frost
Belalie	13/6/33	33	Home Crafts Display	Mrs. A. Cummings
Kalangadoo ...	10/6/33	9	Election of Officers	Mrs. E. Dowdell
McLaren Flat ..	20/6/33	23	Address—Miss E. Campbell	Mrs. D. Elliott

MEN'S BRANCHES.

SOUTH-EASTERN.

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Mt. Gambier ...	10/5/33	—	Annual Social	G. Gurry
Allendale East .	2/6/33	8	Question Box	J. Laslett
Mundalla	8/6/33	15	Address—M. Aird	A. Ross.
Rendelsham....	8/6/33	130	Annual Social	F. White

UPPER-NORTH DISTRICT.

(PETERBOROUGH AND NORTHWARD.)

WEPOWIE (Average annual rainfall, 12.46in.).
May 1st.—Attendance, 11.

HOMESTEAD AND GARDEN.—Paper contributed by Mr. J. Burns:—"First, the site, which must consist of good soil suitable for gardening. The front of the house should face north, as this is most desirable for a flower garden. In this position the garden is sheltered from cold south winds, and is exposed to the sun. Shrubs suitable for this district, which are strong and hardy and require very little watering, are as follows:—Tecoma, Oleander, Honeysuckle, Hawthorn, and Bougainvillia. Suitable flowers are Stocks, Verbena, Phlox, Larkspur, Clarkia, &c. Most of the above should grow with good results from winter rains. There are also a large variety of creepers, which, if planted in suitable positions, make the homestead sheltered in winter and shady in summer. The following are recommended:—English Ivy, Black Boy Rose, Dolichos, Ivy, and Tecoma. Hedges, of course, must be grown to shelter the garden, which would consist of the following:—Wormwood, Tagasaste, Boobyalla. Trees—only a limited number of fruit trees are suitable in this district, and the following are advised:—Lemon, quince, orange, fig, and grape vines. Pine trees and almond trees could be planted close to the homestead, and can be grown without any expense. Gum trees should on no account be planted within three or four chains of the homestead, on account of the leaves blowing into the getterings, and because they rob the ground of moisture. Vegetable Garden.—In preparing these plots it is advisable to put down straw or chaff and burn it; this method destroys most diseases and grubs, and the plots must be well manured. Cabbages and cauliflowers must be planted in the basin system, root vegetables can be sown the ordinary way and covered with an open mesh bag for two or three days." (Secretary, E. Roocke.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Wilmington ...	30/5/33	16	Address, &c.—J. B. Harris	C. Cole.
Wilmimgton ...	13/6/33	13	Discussion	C. Cole
Morchard	9/6/33	13	Discussion	A. McCallum

MIDDLE-NORTH DISTRICT.

(PETERBOROUGH TO FARRELL'S FLAT.)

NELSHABY (Average annual rainfall, 17in.).
April 9th.—Attendance, 14.

TAKE-ALL IN WHEAT.—Mr. D. Wright read the following paper:—"In the year 1909 take-all did a considerable amount of damage to the wheat crops of the district, wheatgrowers reported that the disease was much worse than it had been for many years, and as a consequence, the yield was in many instances considerably reduced. Various theories were advanced as to the cause of the disease, and at that time little had been done in South Australia in thoroughly investigating it. The disease appears to be increasing in many districts of the State, and precautionary measures should be taken in preparing the fallows with a view to combating it. Previous experience in this district has shown that crops on early, well worked fallow were practically free from the disease. Take-all is a fungus disease which attacks the wheat plant in the early stages of its growth, its chief characteristics being a blackening of the sheath and stem of the plant and death and decay of the roots. The spores of the fungus appear to thrive best on land which has been fallowed late in the season or which has been worked in a dry state and left open and loose. Ploughing under take-all affected stubble is favorable to the growth of the disease. It is not so bad on early, well worked fallow, as if the land is well prepared and kept free from weeds, the spores having nothing to thrive upon will starve themselves out. The disease has rarely been known on new land. Oats are not likely to be much affected by take-all, in fact many farmers report that they grow much better on take-all affected ground. The following methods of combating the disease are recommended:—(1) Early fallowing and good after cultivation to bring the soil to a good mechanical condition—a shallow layer of loose earth over a firmly compacted seedbed. (2) Do not plough deep late in the season, and do not plough deep under any circumstances unless the fallow can be given the necessary preparation to compact the seedbed. An open, loose seedbed is only

PARAFIELD POULTRY STATION.

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Free on Rail, Salisbury.

DELIVERY.—CHICKS—August and September.
EGGS—July to September.

Intending breeders should recognise the importance of establishing their flocks with only the very best of stock also, pay particular care to the size of the egg. The future of the poultry industry in South Australia is almost entirely dependent on the export trade; the size of the egg for export is of the greatest importance. The breeding stock at Parafield is carefully selected and every egg set or sold is of a minimum weight of 2ozs., and a large percentage considerably over.

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C. F. ANDERSON, Poultry Expert.

courting trouble, not only in regard to this disease, but to wheatgrowing generally. Use a payable amount of super—56lbs. in this district. Heavier dressings only promote a luxuriant growth of stinkwort which greatly impoverishes the soil. (3) Rolling the land and the use of the harrows will have a beneficial effect. (4) Burning the stubble of affected crops kills the spores. (5) Sow oats on land affected by the disease. Where only small patches of crop are affected, straw should be spread and burnt. In fallowing, where there is no take-all, always plough under the stubble, as apart from increasing the humus content of the soil it helps to control sand drift. It has not been proved whether any one variety of wheat is more subject to the disease than another, and if the foregoing methods are adopted in dealing with the disease wheatgrowers should have no difficulty in controlling it.''

Sidelines on the Farm.—Paper by Mr. J. Franks:—''There is more profit to be made from cows than either sheep, poultry, or pigs, on account of acreage. Five or six average cows will bring in about £50 clear profit, not including milk and butter for household purposes. Then there are young stock coming on for market. 100 to 150 is as many sheep as the average farm can run. The price received for wool does not equal the good sheep do the land, cleaning the fallow, and tramping and manuring the soil. It is recognised that a flock of sheep saves a team of horses on a larger than average farm. When the crop is up, say, 5in. or 6in. high, sheep driven from one side to the other of the paddock several times proves beneficial, they tighten the soil around the roots and help to conserve moisture. Do not turn sheep into the crop unattended, they eat it off in patches, thus making it uneven. I figure that 100 sheep should bring in £50 per annum, including meat for the house. The Merinos are the best sheep for Northern conditions, and they do not require such expensive fencing. Cross-breds almost require cyclone or wire-netting if they are to be kept within bounds. Poultry do not appear directly to swell the banking account considerably, especially when the grain bill and the price of eggs is taken into consideration. The latter, however, does not lessen their food value one whit, and if one pauses to consider the hole left were eggs and poultry cut out of the daily fare, their value as a sideline would be realised. Pigs are very low in price, but where there are cows, pigs must be kept to use the surplus milk. Do not keep pigs too long, or they will eat the profits. It does not pay to feed pigs on clean wheat. If a few acres of barley are sown horses and cows may be put to graze on it, and if taken out by the end of August there will still be enough grain from the crop for the pigs, so that the feed consumed will not be over costly, thus allowing the sum the pigs do bring in to be all profit.'' (Secretary, A. M. Lawrie.)

REDHILL (Average annual rainfall, 16.55in.).

May 9th.—Attendance, 8.

Farmers' Problems.—Mr. J. Clothier preented the following paper:—''One of the most exacting of the farmer's problems is his health and that of his wife and family. The health of all must be maintained if each member who is of age to assist in the manual work is to do his share. During the last four or five years the chance of a holiday by travel is almost out of the question. Situated as we are 20 odd miles from the beach, there is camping on the beach and fishing for those who like it. It is a wise policy to try to arrange the affairs of the farm so that the housewife can have a few days away from home, and the worry of managing after harvest and the never-ending round of meals, &c. The men folk can often spend half of a day shooting rabbits or foxes. Some sort of recreation is essential. The financial side comes under the same heading, and it behoves a farmer to always keep a fairly exact record of his transactions. More often than not the farmer with such a record will receive kinder and more lenient treatment from business people who supply him with goods than the man without it.'' Other problems dealt with by the writer of the paper included the disposal of farm produce, wheat storage, and items connected with the general management of the farm. (Secretary, W. Pengilly.)

NELSHABY AGRICULTURAL BUREAU.

The annual meeting of the Nelshaby Men's and Women's Branches of the Agricultural Bureau was held in the local schoolhouse on Thursday evening, July 6th. There was an excellent attendance of members from both Branches. The Secretary (Mr. A. M. Lawrie) presented the annual report, and the election of officers for the Men's Branch resulted as follows:—President, Mr. E. Williams; Vice-Presidents, Mr. J. Franks, jun.; Mr. H. Franks; Honorary Secretary, Mr. A. M. Lawrie. Mrs. R. P. Noble was elected President of the Women's Branch. Mr. E. L. Orchard (District Agricultural Instructor), of Department of Agriculture, presented the trophies won in the 1933 Seed Wheat Competition. These were as follows:—Silver cup presented by the Branch, to be won twice by the same competitor before being won outright, for the best two entries—R. P. Noble. Previous winners of the cup have been:—1929

L. C. Crouch and 1930 L. C. Roberts. Mr. C. G. Plenty won the Champion Variety and was handed an E.P. cakedish. Mr. Plenty offered to donate another cup when the one being competed for had been finally won. Mr. F. C. Richards (Assistant Secretary of the Agricultural Bureau), acting on behalf of the Advisory Board of Agriculture, presented to Mr. Lawrie a certificate conferring on him Life Membership of the Agricultural Bureau in recognition of the services he has rendered to that organisation. Mr. Lawrie has been a member for 21 years. During the whole of that time he has acted as Secretary and has only missed three meetings.

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Koolunga	9/5/33	11	Discussion	I. Jones
Red Hill.......	6/6/33	7	Paper from *Journal*	S. Pengilly
Yandiah	12/5/33	10	Address—E. L. Orchard .	F. Jettner

LOWER-NORTH DISTRICT.

(ADELAIDE TO FARRELL'S FLAT.)

GREENOCK (Average annual rainfall, 21.56in.).

April 25th.—Attendance, 21.

The Value of Fertilising.—The Hon. Secretary (Mr. A. Schubert) read the following paper:—"In many instances farmers do not fail to make full use of fertilisers. Some farmers sow wheat and other cereals without super, or only use 40lbs. to 80lbs. per acre. In our district not a single bushel of wheat should be sown with less than 187lbs. of 45 per cent. or 48 per cent. super per acre. One point about using superphosphate for wheat is that while it gives strong healthy growth it will not cause rank growth. Often to the casual observer there appears no difference in the growth of two crops, one of which had a light dressing of super and the other a heavy; but if a few heads of wheat are selected at random and the grains counted the result will indeed be a surprise if he has never done so before. The vegetable grower of all primary producers knows how to make the best use of fertilisers, as vegetables cannot be grown successfully without fertilising very liberally. The vine and fruit grower is perhaps the most backward in feeding his land, and yet in many instances he is getting good returns year after year without applying any fertilisers; but is it advisable to take a crop of grapes or fruit every year without putting back some food for the vine or tree? Gradually the necessary organic matter and humus is decreased until the soil has the appearance of being dead; it cakes down easily, does not absorb and hold moisture, no grass grows, and gradually the soil becomes washed away. Is not that the reason why some old gardens look so miserable? Surely the wise gardener should apply more fertiliser, stable manure if possible, or as the next best thing, bonedust. Super would be of value, if for no other reason than to make a good coat of grass grow, because that will help to absorb and retain the necessary moisture, besides making green manure when ploughed under. It is my firm conviction that the vineyard and fruit garden require fertilising as much as any other phase of primary production. I also believe that the average per acre would be increased and the average return over a number of years would be considerably better. With careful and judicious fertilising, the fruit and grapes would be of better quality and there would be a better growth of wood. Land that is dressed continually with fertilisers retains the moisture much better. Do not expect immediate response from the garden when applying fertilisers, as it will take a couple of years before a return is noticed. However, keep on applying manures every year, increasing the quantity until about 4cwts. are applied every year, and every grower who does so will find that it pays." (A. Schubert, Secretary.)

May 15th.—Attendance, 31.

Seasonal Reports.—*Fruit* (Mr. H. Lange): Generally speaking the 1932 pruning season was satisfactory, the buds of practically all fruit trees being good. It was hardly expected that apples would look so well after having a heavy crop the previous year. Black bud was again noticed in the apricots, especially in places where the water did not drain off. The blossoming of the trees was about a fortnight later than usual. Some of the apricot buds opened up early, but cold, wet weather set in, and the others remained stationary for about two weeks. Walking through the gardens just as the later buds were setting, one would see an occasional apricot as large as a big marble from the first buds. The setting of fruit was good, more so apricots which required a fairly good thinning. One peculiar point about apricots this year was the shedding of fruit almost right up to the time they were fit to pick. A fair amount of curl leaf was noticed in peach trees, and gardeners should be more careful when spraying. Green aphis also put in an appearance again, causing gardeners a fair amount of worry. Apricots generally were only a fair sample; the size was generally good, but some fruit was fairly spotted, whilst others were hail marked, consequently the majority had to be dried, leaving very little fruit from this district for canning purposes. The weather for drying in the early part was good, but later in the season was perhaps the worst gardeners have experienced for a long time. Prices for apricots were satisfactory, fresh fruit being fixed at 6s. per case and dried for an average three crown about 7d. Peaches were of a good quality, not being affected by hail. Prices varied from 4s. to 8s.; as this fruit extends over such a long period a good price is generally received for early ones or in slack periods. Dried peaches realised about 5d. or 6d. The rain at the end of January split a fair proportion of Splendour prunes, but the later varieties benefited by the rain. The weather for drying prunes in the latter part was not all that could be desired; there is no more tiresome job than stacking and unstacking trays. Prices for dried prunes were about 2½d. to 3d. per lb. Apples appear to be one of the best fruits to grow, especially where irrigation can be practised. This year the export apple was not so plentiful, owing to the large percentage of codlin moth. The export price to the grower was between 4s. and 5s. a case clear. Codlins and marked ones for local use were considerably less. The largest portion of the pears was again sent to Adelaide for canning under the management of the Barossa Pear Pool. It was hoped to net as good a price as the previous year, but a complaint was made of the heavy percentage of codlin fruit. It was thought that the cause lay in neglecting the first spray; this spray should always be done carefully and thoroughly, both in apples and pears. Spraying at any time should be carried out with keenness, as the gardener will eventually reap the benefit. *Grapes* (Mr. E. Roennfeldt).—The season 1932-1933 has been very favorable for grapes in our immediate district. After having good winter rains, and with the vines making stronger fruiting wood, it was anticipated that there would be a fairly good grape harvest in 1933. The winter months being fairly wet, pruning was in most cases a little later than usual. The feed in the gardens having had a good start, also enjoyed the rain to the full, and again proved in the Seppeltsfield district that some of the vineyard lands would make good grazing or hay-growing country. Quite a number of growers swabbed their vines as a preventive against black spot. The sorts most subject to black spot are Doradillo, Frontignac, and Grenache, and most of the table grapes. This disease usually makes its appearance about Christmas time and new year if the weather is damp and sultry. Swabbing the buds with a mixture of sulphuric acid and water before the buds burst is very effective against this disease. Some growers swab the vines every year, even though no signs of the disease are present, contending that prevention is better than cure. Ploughing was done in September, which was also later than average. No difficulty was experienced through dryness, the ground being moist enough until the end of October. Vines began to burst a little later this year, also due to the wet weather, but by the end of September were growing vigorously, when a severe frost was experienced. This being the second frost in succession, it was thought that the affected areas would not have much of a crop, but contrary to expectations, the second growth showed a fair crop on some varieties. An examination of the garden at the end of October would show that some varieties were showing an exceptional heavy crop, especially Grenache, Doradillo, and Shiraz, and given good weather at the most critical time, when the bunches are flowering, would yield heavily. According to the way the berries set, the weather must have been very favorable. Some growers make the practice of topping the vines during this period, the topping having the effect of checking the flow of sap, and thus helping the bunch to retain the berries, this being especially the case with Grenache. Cultivating was the main job during October and November. Moist weather continued until the end of October, when it ceased abruptly. During November there was practically no rain; this gave the Seppeltsfield growers a chance to work down their top-dressed pastures; even discing had to be resorted to in several instances. Summer being very mild—with no heat waves and an abundance of moisture underneath—vines had little to distress them during December, and kept growing strongly. January continued to be ideal, and by the middle of the month everybody thought that given a good rain during the month a bumper vintage would be assured. Rain fell on January 19th, and vines again began to grow, which resulted in strong rods for this year's pruning. February generally tells on the vines, and a series of hot days usually ripens the grapes very quickly. By the end of the month Shiraz in this district generally begins to shrivel. This, however, was not the case this year, for it was quite evident the vintage would be three or four weeks later than other years. During March the bunches kept filling out well, and with the thick foliage the vines were carrying the ripening of the grapes was very slow. Some of the cellars opened in the latter part of March, this being four weeks later than four years ago, when the first grapes were taken in at the end of February. Growers were now inspecting the gardens for ripe bunches to have tested. Generally speaking, the 'Beaume' of the grapes was below that of other years, especially the Grenache. Even Mataro, which at first seemed to have only a fairly light crop, developed bunches the like of which had not been seen for years. The crop in general yielded about 50 per cent. more than last year for those fortunate in being able to pick at the right time. Mould and rot considerably lessened the tonnage of the less fortunate ones.'' (Secretary, A. Schubert.)

LIGHT'S PASS.

May 8th.—Attendance, 30.

Care of Pruning Tools.—The following paper was read by Mr. A. Summers:—''In these times of low returns from the land it is necessary for every farmer and gardener to make his tools and implements last as long as possible, and with the aid of a workshop and a few good tools much of the repair work can be done at home. Perhaps the most important tool is a vice, this should be rather large for preference, as a small one is apt to be strained, and consequently will not hold firmly. A hack saw is a cheap and very useful addition to any workshop. A breast drill or a drilling machine should be included in the equipment. When buying a breast drill, see that it has a three-jaw chuck, not a two jaw, because the latter will not hold the small straight shank drills. Another tool—although not cheap to buy, is a wonderful asset to any workshop—a set of stocks and dies. Bolts and nuts are always needed, and with the aid of stocks and dies an old bolt can be reconditioned at a moment's notice, or a new one of any required length made just as quickly. A large soldering iron is preferable to a small one. Soldering is not difficult provided the job is cleaned well and the correct flux used for the different metals. The soldering iron should be well tinned. Last, but not least, is a forge, and the jobs that can be done with its aid are almost innumerable. Picks and crowbars can be sharpened, and plough shares should not be beyond the skill of the handy man. Also, he can try his hand at shoeing horses as well as straightening bars that are often bent on implements. All these jobs can be done quite well at home, and without a set of tools would mean a special trip to the town. With a little more care and attention than they usually receive the useful life of a pair of snips can be greatly lengthened. The first job to be done with a new pair of snips is to rivet the blade securely to the handle, the method of

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fastening the blade with screws—used by the makers—is very unsatisfactory, the screws work loose in a very short time, and so give trouble. For rivets use flat headed nails that are a firm fit in the rivet holes. The head of the nail is filed down so that it fits into the countersunk hole in the handle. The holes in the blade should also be countersunk on the face side and on the back hole, this is imperative if a good job is to be made, because the rivet must be filed flush with the blade to enable the lever to fit snugly against the blade. If that hole is not countersunk it is far better not to remove the original screw, because it will be much more effective than a badly fitted rivet. Except for grinding the shoulder off the blade, this should be sufficient attention for a new pair of snips. After the snips have been used for some time the bolt begins to give trouble, and it is mainly neglect of this that is the cause of the snips being discarded, perhaps before it is really necessary. Spare bolts for snips can be purchased at most of the hardware shops in the district, and at about one shilling each are quite a good investment, if by so doing one can save the purchase of a new pair of snips. It is the square hole in the lever that wears first as a rule, and if the fitting of a new bolt is neglected at the first sign of wear, this hole tends to become round, so making the fitting of a new bolt extremely difficult. The first spare to be fitted is a new 8in. The spare of this may have to be filed a little to enter the lever, but this bolt should last longer than the original, it is invariably of greater length and so has a greater bearing surface than the other. Another 8in. may take up the wear next time. Following this a 9in. is used. Filing off the square may again have to be resorted to, because this bolt is a good deal larger than the 8in., also the round shank may have to be filed smaller and the hole in the blade handle trued up, because it will no doubt have been slightly worn by this time The 9in. bolt is again an improvement on the 8in., it is longer and also has a bigger head, so reducing play and wear in the snips. When this bolt has become loose another new 9in. can be fitted, and will be found to satisfactorily take up any further wear. Sometimes the blade may be worn past further use while the rest of the snip is still in good order, so that the fitting of a new blade may be well worth while. One reason that it is worth fitting a new blade is that it is almost invariably of better quality than the one that is fitted to a new pair of snips when purchased. A few details as to the methods employed in the fitting of a spare blade may not be amiss. First ascertain whether the holes in the blade correspond with the holes in the handle—usually they do not. Again, the holes may appear to correspond, but when the lever is fitted it may be found that the blade laps too far or else not far enough, and this must be ascertained before any rivetting is attempted. This is best done by screwing the snips together with the bolt and adjusting the blade to the lever, if everything corresponds, well and good; if not, the holes in the blade must be filled up and the blade redrilled. To fill the holes they must be countersunk on each side and a rivet put in and filed off flush with the blade. The snips are then put together again and the blade adjusted to the lever. I prefer it to overlap the back of the lever a little, this will give more use from the blade than otherwise would be the case. When the blade is adjusted according to requirements, screw the snips very tightly together and the front hole can be drilled. By entering the drill through the hole in the handle and drilling the blade, the holes should correspond perfectly. The face side of the blade is again countersunk and then rivetted, all the time keeping the snips screwed tightly together. When this one is rivetted securely the snips can be taken apart and the other hole drilled and rivetted in the same manner as the first. On first thoughts all this appears to be a great deal of trouble, but when the price of a new pair of snips is taken into consideration it will be found well worth while spending a little time now and again in repairs and renovations.''

The following seasonal reports were given:—Apricots, W. Koop; pears, C. Robin; grapes, A. J. Chapman; apples, L. Plush; cereals, T. Roenfeldt; prunes, A. Milway. (Secretary, C. Verrall.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Light's Pass....	6/6/33	17	Discussion	E. Verrall
Wasleys	8/6/33	20	Address—A. H. Codrington	C. Currie
Snowtown	9/6/33	13	" Ensilage," J. Kirchner..	H. Hocking
Penwortham ...	7/6/33	12	Address—J. O. Hatter ..	A. Jenner
Truro	19/6/33	19	" Milk Testing," M. Tohl..	L. Davis
Lyndoch.......	6/6/33	14	Address—G. Quinn	J. Hammatt, Williamstown

YORKE PENINSULA DISTRICT.

BRENTWOOD (Average annual rainfall, 15.43in.).

Meeting held June 1st.—Attendance, 16.

SIDELINES ON THE FARM.—Mr. M. McKenzie read the following paper:—"In times of depression it is difficult to determine which are "side-lines" on the farm and which are not. In this locality one may regard the growing of wheat, barley, and oats as general farming, and for mixed farming the addition of a flock of sheep. No side-line should be started without a definite object in view. Some side-lines may be considered as being more profitable than general farming, for instance, fat lambs may be raised and marketed about September to obtain some ready cash before anything can be realised from wool or grain. Draught horse breeding is also a profitable side-line, when horses two or three years old may be sold for about £30. This line may be made more profitable if a stallion is kept on the farm as a worker, but in all cases a farmer should obtain a good sire. Cows are the next to be considered. For this district the Milking Shorthorn is favored, as they are good milkers and are one of the best beef breeds on the market. Where there are several cows kept on the farm, young pigs may be reared on the separated milk. At present, neither of these lines may be considered very profitable, but without separator milk young pigs are a failure. Poultry is also a necessary side-line, but there is also very little return from them when eggs are down to 4d. per dozen. There is an old saying that a 'shilling saved is a shillling made,' and this applies to the farm as well as anywhere. If a farmer can do his own blacksmithing, mason work, or a little mechanical work it is all a saving." (Secretary, E. Carmichael.)

Other Report Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
South Kilkerran	9/5/33	14	"Farm Management," O. Linke	R. Hasting

WESTERN DISTRICT.

CHILPUDDIE ROCK.

May 10th.—Attendance, 14.

FALLOWING.—The following paper was read by Mr. Herde:—"In every farming district in South Australia it is essential to fallow in order to reap full benefits, and prevent diseases such as take-all, &c. As the class of country in this district is by no means the best, it is all the more essential to fallow a fair proportion of the cleared ground in order to restore the fertility of the soil. Begin fallowing operations as soon as possible after completing seeding. The ground should be cultivated at the beginning of seeding operations. Weed seeds will then germinate and can be turned over on completion of seeding. This should be done with a five or six furrow plough. Owing to the unevenness of the ground, ploughing should be done about 3in. deep, to loosen the ground and turn weeds properly. By harrowing the ground three weeks later the remaining weeds are killed. The ground should be worked two or three times to prevent the growth of weeds. Bare fallow is recommended in preference to a rotation of crops in this district, because sheep are not available to graze off oats." (Secretary, H. Brown.)

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ELBOW HILL (Average annual rainfall, 11in. to 12in.).

April 4th.—Attendance, 17.

How to Obtain a Better Price for Wheat.—Introducing a discussion on this subject, Mr. S. Wake said the price of wheat at present was below the cost of production. There were over 3,000 farmers who were unable to get relief in South Australia from the private banks. He believed in pooling wheat, whereby many charges would be eliminated. He favored a local consumption price for wheat which would increase the price by 3d. per bushel. A reduction in the prices of tools of trade through free trade would be equivalent to another 3d. per bushel. This would make 6d. per bushel more for the wheatgrower. Mr. W. T. Cooper was in favor of free trade. If Australia expected other nations to take her wheat she must take some of their goods in return. Tariff walls were a curse to any country. He could see no hope for a better price for wheat at present. Mr. J. Rehn believed in tariffs. England had only recently adopted a moderate tariff. There was no country in the world prosperous to-day, yet the world was never richer in goods. There was something evidently out of control. Wheatgrowers were receiving 5d. per bushel through exchange. Mr. G. Payne favored a compulsory pool controlled by farmers, bulk handling, and a home consumption price for wheat. Through bulk handling £500,000 per year would be saved in cornsacks alone. Silos for bulk handling would cost £1,500,000 to erect. A levy of 1d. per bushel for three years would pay all the necessary expenses. Steamers carry wheat in bulk at 3d. per bushel cheaper. Mr. G. Rehn favored compulsory pooling, so that most of the charges would be eliminated. Many people looked askance at compulsory pools, but they should bear in mind the vast strides which had been made in the dried fruits industry through compulsory pooling. He believed in free trade. Mr. R. Mills did not agree with a home consumption price for wheat. A compulsory pool would be for the farmers' good. Rev. H. White spoke of the benefits which had accrued in the dried fruits industry through compulsory pooling. Fifteen per cent. were consumed in the Commonwealth and 85 per cent. were exported. A home consumption price would certainly cause irritation in some quarters. The money problem was the problem at present. When money begins to flow freely things would right themselves. (Secretary, W. Cooper.)

GOODE (Average annual rainfall, 9.95in.).

May 10th.—Attendance, 15.

Underground Tanks.—Discussing this subject, Mr. C. Will said the best method of making an underground tank was to take out as much earth as possible with a scoop, and then shovel out the remainder. If the tank was made cylindrical in shape, it would not bulge nor crack so readily. It would also be cheaper, because of its greater holding capacity. The best and cheapest method was to build concrete walls 6in. thick. If lime was used, great care should be taken to remove all unslaked limestones, otherwise these stones will slake in the walls and cause them to crack. It was a good plan to build the walls of the tank approximately 3ft. above the ground level, that would not only prevent white ants from entering the timber in the roof, but also stop sand from drifting into the tank. Members thought it advisable to make a small catchpit, which would collect practically all the mud, and thereby reduce cleaning out the tank to a minimum. (Secretary, B. Linke.)

MILTALIE (Average annual rainfall, 13.56in.).

April 22nd.—Attendance, 13.

Seeding Operations.—Mr. D. Bagnell read the following paper:—"At the present time many farms are worked under adverse conditions, for in many instances one team has to do the work where there should be two, and it is a common occurrence to see teams working one or two horses short, but the difficulty does not end there, it also applies to finance—what with droughts and present low price for primary produce and the exceedingly high prices ruling for horses, &c., makes it impossible to buy and show a profit. This means that the land is not being prepared for cropping as it should, except by a few of the more fortunate farmers who have been able to maintain their teams and have sons to work them, they do not feel the position quite so keenly. Even those with tractors do not feel inclined to give the land the working it really should have, because of the high price of fuel and maintenance compared with with the low price of primary products. One remedy is sometimes offered—grow less wheat—but that does not altogether appeal to farmers, knowing that the country relies solely on its primary products. In preparing for seeding first consideration must be given to tilling the soil. All fallow should be well worked to kill all weeds and conserve all available moisture—especially at this time of the year—whenever the opportunity offers, but in seasons like the present working is rather difficult. For instance, a few points of rain starts weeds on sandy patches in a paddock, and every few points helps them on, and the heavier soil being too hard to work places the farmer in an awkward position when the season breaks. Pick all stumps and stones and so reduce repairs to a minimum If shoots are scattered and fairly large they should be cut and burnt, because neither combine or harrows can make a job when full of rubbish. Burn all shoot and trees around stone heaps and along creeks and edges of cultivation. See that the drill or combine is in good working order, that the tines cut an even depth, that it has new shares, and that the tubes carry the seed and super down to a firm seed bed. Sharpen harrows, if necessary, so that they will do good work if there are weeds. *Pickling Wheat.*—Where dry pickle is used, get it done early. Dry pickle gives a better and quicker germination, keeps the wheat free from smut, and has little or no wearing effect on drill and combine if used judiciously. Drill in oats so that they will not interfere with the sowing of wheat. By getting this work done early it gives times to deal with odd jobs which crop up in seeding. *Seeding Operations.*—The last few years in this district have emphasised the necessity for earlier sowing and more early and mid-season varieties of wheat. The varieties I favor are Nabawa, Waratah, Imp., Gluyas, Early Gluyas, Rance, Felix, and Gallipoli. The time of sowing often depends on the break of the season; for stubble land I advocate the end of April with early wheat, fallow first week in May, and finish by the middle of June. The depth of sowing should be 1½in. to 2in., and worked with a combine where possible and cross harrowed; cross work with all implements as much as possible, it keeps the land more even. The rate of applying super seems hard to determine, and leaves much room for discussion. Some have sown 112lbs. or more with success, others, again, have met equal success with 60lbs. in the same class of soil; personaly, I find the heavy dressing on heavy land promotes too much growth. In the early stages, when the dry period sets in—which is characteristic of this district—the heavy application gives the crop a severe setback, and very often causes failure. Locally I think 60lbs. a fair dressing for heavy fallow land and 45lbs. on the lighter loam." (Secretary, G. Smith.)

MOUNT HOPE.

Attendance, 7.

BACON CURING.—Mr. G. Vigar presented the following paper:—"In these days of depression the farmer should attend to as many side lines as possible, in order to keep as much of the ready money he receives for essential purposes, and he must remember a shilling saved is a shilling earned, and one way to do this is to cure his own bacon on the farm. I prefer the Berkshire or one of the first crosses; the Berkshire-Tamworth

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is a good pig, as also is the Berkshire-Large White. Having selected the pig, it must be fed properly. The best feed for growing pigs is household refuse and milk slops mixed with grain; a pig fed in this manner should weigh at 10 months old from 160lbs. to 200lbs. dressed weight. Arrange to have the pig ready to kill sometime during winter—from May to August; during these months it is easy to get a good cure. Prior to kiling the pig have plenty of boiling water handy for scalding; I use a shallow trough for the scalding. Kill the pig by shooting it with a rifle, and then sticking it. To do this, hold the head well back and slit the skin to escape the brisket bone and then stick the knife in a direct line for the tail. This should give a good flow of blood. When the pig is dead, put the boiling water in the trough and test the heat. To get a good scald the water must be at right temperature. To test this, sprinkle some blood, and when it turns about a maize color the water is ready. Remove the hair as quickly as possible and then dress the carcass, leaving it hanging overnight, and in the morning it will be firm and in good condition to cut up. When cutting up a pig, first use a saw and cut right down the backbone. Then lay the two halves on a table and take out the pork bones, cut off the hams, and cut the side into a size that can be put conveniently into the pickling cask. Leave the pork in dry salt for 24 hours before putting it in the pickle. The pickle used for each 100lbs. of pork is made as follows:—8lbs. salt, 3lbs. brown sugar, ½lb. ground black pepper, and 2ozs. saltpetre mixed with cold water. Place the pork in the cask, the hams at the bottom of the cask with the skin downwards. Puncture the skin around the thickest parts with a small wire probe, next to the ham lay the shoulders, and then the sides. Having placed the pork, pour on enough of the mixture to cover the meat, then put on a weight to pack it close together. After three days in pickle remove the meat and stir the pickle and place the pork back again in the same position. Leave it, and in three weeks the thin portions will be cured and ready for use. The hams and shoulder should be in pickle for a month, by which time curing is completed. Then the bacon is taken out and hung up to dry for a few days. Then take it down, wash it lightly, hang it again for a few more days, and then rub it over with pollard or crushed grain meal. If the meat is to be kept for any length of time, place it—especially the hams—in calico bags and hang it in a dry, cool place, and it will keep for six months in perfect order.'' (Secretary, A. Myers.)

TARAGORO.

April 7th.—Attendance, 7.

Mr. M. Guy contributed the following paper on ''Sheep'':—''Sheep are necessary on most farms as a sideline, to eat off surplus feed, and to help in keeping fallow clean. In this district Merinos are favored; they are good doers, the demand for their wool is greater than other breeds, and they are not bad fencers. No farmer should be under the necessity of buying meat from a butcher or asking for his neighbor's sheep to be brought in to eat off surplus feed. Fat lamb breeding is not very profitable in this district, because prices at Port Lincoln Freezing Works are not consistent. The best lamb for the freezers is a Dorset Horn-Merino cross. This is a quick maturing lamb, and is in great demand. This lamb can be marketed at about 11 to 15 weeks. *Hand Feeding.*—There is no doubt that sheep thrive best on sweet, short, natural pasture, and this is probably the best and cheapest way of providing for the feed requirements of sheep. On the average farm, a great portion of which is usually arable, this type of pasture is present to a limited extent only. It is usually represented by land temporarily out of cultivation, which, according to seasons or circumstances may or may not be covered by an adequate sward of feed, usually weed growth. A farmer who has a flock adequate to the size of his holding cannot afford to rely entirely upon the chance seedings of Nature. Hence he is compelled to fall back upon the second-best, which is a sown grazing crop. Best for this crop are oats sown on stubble, and those who have standing crops of lucerne can take full advantage of them, but on the majority of sheep farms four to eight weeks of hand feeding is unavoidable, if sheep are to be kept in the pink of condition. The majority of wool men keep a fair percentage of wethers in their flocks, which in the event of over-stocking would be placed on the market with the culls, because no sheep farmer wishes to sell his breeding ewes. If he has a ewe which has two wrinkles, one each side of her tail, such a ewe should be culled out; these wrinkles tend to hold moisture, and attract the blowfly. Water should be laid on in every paddock so that the sheep can go and come to water whenever inclined. If there is no shade around the trough in summer, it is advisable to erect an open-sided thatched roof shed. Sheep scarcely leave the water in summer. This shed should be erected about 2 chains from the trough. Crutching should take place just before the green feed starts, because it is inclined to scour the sheep. There should be a limited number of ewes to one ram. One ram should not cover more than 50 ewes. Tailing should take place when the lambs are about four to five weeks old; if left until later, it tends to check the growth of the lambs.''

Dairying.—Mr. E. James read the following paper at the meeting held on May 4th:—"During the last few years wheat growing has not been profitable, and many farmers have turned to other sources to increase their income. Dairying has become a popular side line. First of all, it is best to try and procure a good breed of milking cow, and I favor the Jersey or Milking Shorthorn. Both breeds have proved that they are rich in butter fat. There are two butter factories at Port Lincoln, thus giving a market for cream all the year round, and doing away with the drudgery of making butter during summer, which is often impossible owing to the heat and lack of facilities for keeping the cream in good order. It is essential that the cows be properly cared for, otherwise the best results cannot be obtained. No animal has a greater strain on its system than a cow, yet it often receives insufficient feed and water. During autumn, when paddock feed is generally scarce, cows do very well on cocky chaff and crushed oats. In spring there is nearly always good paddock feed, and it is advisable to give them a feed of good hay-chaff morning and night. To prevent bone-chewing give each cow about once a week a handful of salt and super mixed into the feed. Cowsheds must be kept clean. It is better to milk in the open rather than in a dirty cowshed. To keep the cows in full milk, each cow should rear one calf a year, and if a good breed is kept, there is always a sale for the surplus cows." (Secretary, T. Winter, Cleve.)

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Kapinnie	5/5/33	10	"Marketing Wheat," J. Lawrence	O. Green
Mangalo	—/3/33	—	"The Wool Clip," K. Nield	K. Nield
Mangalo	2/5/33	11	Discussion	K. Nield
Smoky Bay ...	3/6/33	8	Discussion	K. Harrison
Pinbong	8/4/33	10	Discussion	C. Scholz
Mudamuckla ..	16/5/33	13	Address—W. H. Brownrigg	A. Maguire
Goode	7/6/33	18	Addresses—W. H. Brownrigg and C. Goddard	B. Linke
Maltee	8/6/33	19	Addresses—W. H. Brownrigg and C. Goddard	E. Schwarz
O'Loughlin	8/6/33	12	"Sheep on the West Coast," E. Pfieffer	E. Pfieffer
Pygery	6/6/33	11	Annual Meeting	A. Day
Cungena	1/6/33	11	Annual Meeting	A. Voumard
Laura Bay	13/6/33	16	Paper from *Journal*	W. Edson
Pinbong	10/6/33	11	"Wheat-growing," H. B. Scholz	C. H. Scholz
Mangalo	6/6/33	10	"Fruit Garden," — Turner	K. Nield
Kelly	17/6/33	20	Formation Veterinary Lodge	I. Grund

EASTERN DISTRICT.

(EAST OF MOUNT LOFTY RANGES.)

BOOLGUN.

May 14th.—Attendance, 13.

Crush Pen and Loose Box.—Mr. A. Werfel, in a paper on this subject, said the combined crush pen and loose box could be used for catching horses to break in, catching colts for castration, for branding stock, to shut off foals from their mothers to wean them, and as a stallion yard. Any beast that had been injured could be put in the crush pen and its wounds attended to without having to rope it or throw it. Mr. Werfel drew a sketch and outlined the working and construction of the box. The Secretary of the Boolgun Branch advises that anyone interested can obtain a copy of this crush pen on application to the Boolgun Branch. (Secretary, G. Spencer.)

MONARTO SOUTH (Average annual rainfall, 14in. to 15in.).

May 20th.—Present: 21 members.

Odd Jobs on the Farm.—Mr. M. Kuchel read the following paper:—"Odd jobs are part of every farmer's work. March and August, generally speaking, are very opportune times to deal with the odd jobs about the farm, because there is very little to be done on the land at that time. In March see that all hay stacks are well covered with straw. When putting on loose straw, shake it up well and put it on evenly. In tying down the straw do not use too heavy a weight, just sufficient to keep the straw from blowing off. If too heavy a weight is used, it tends to draw the wires into the straw, leaving a place for water to run down, and finally to work its way into the stack. When putting on loose straw, damp it a little. The straw will settle down tightly and make a better cover. I prefer strips of wire netting for tying down a stack. This prevents birds, fowls, &c., from making holes and tearing the straw about. Another important job is fencing. A good plan is to go around the fences on the land intended for cropping, and if this is done regularly the farm should be well fenced. Water conservation is also of importance. Clean all dams when dry; also all catch drains leading to the dams, so that as soon as rain falls the water will have a clear course to flow in. Clear all lands and fallows to be cropped of any big stones, stumps, trees, shoots, &c., thus saving time when seeding or ploughing begins. Set aside a day or two for the harness shed, overhaul all weak harness, repair all broken harness, or any showing signs of weakness. Repair chains and swings, and replace or repair any broken links or eye bolts, and take out any wire links that have been put in hurriedly, these only result in time lost later on. Go through all implements which have been or are to be worked, replace broken parts, links, &c., and, if possible, clean up and paint them so that every implement is ready for use when the time comes for it to take its place in the field. Renovate the farm house and outbuildings, give them a coat of paint and repair any broken articles. Remember that repair saves decay. Use, whenever possible, good material, it may cost a little more in the first place, but it will be found to be cheaper in the long run.'' (Secretary, C. Altmann.)

PINNAROO (Average annual rainfall, 14.70in.).

May 26th.—Attendance, 16.

Mr. A. F. Young contributed a paper, ''Wheat Growing and Sheep,'' as follows:—''Of late years a good crop of wheat has only been profitable with the help of sheep, while a poor crop has been disastrous. The point is stressed that wheat growing must take first place, and sheep be a side line. The areas of the various holdings are not large enough for grazing only, and without cultivation few sheep can be kept on the limited area. That being so, a farming plant must be kept, and to pay interest on the outlay it should be put to the best possible use. In comparison, farming methods at Pinnaroo compare very favorably with those of other parts of the State. Our most noticeable weakness is in the attention given to fallowing and the care of fallow—the all-important part of wheat growing. On quite a number of farms there is a delay in starting, and only part of the seeding strength is put to use, as though 'any old time will do.' The successful wheat grower gives fallowing the necessary attention, and is proving that whether the plough turns over grass, oats, stubble, or wheat stubble, a good crop of wheat can be grown. I favor the standard makes of 10-furrow cultivating plough for the first working, or the disc if the straw is thick, working to a depth of about 2ins. Our land does not need a great amount of working. It is not possible to suggest any set rule, for seasons differ, also the necessary cultivation. The harrows should be called into first use after the grass has died off from the plough, otherwise they will transplant instead of kill. Then, if sheep are allowed to run over the fallow and weeds watched, one or two cultivations before harvest should be sufficient. It is very noticeable that the best farmers—those who have consistent averages—never allow the fallow to get out of hand, and with few workings always have it in a condition to conserve moisture. The cultivation should be finished before the heat of summer. Fallow is always in the best condition if it has rain on it following the last spring working. I have twice during harvest worked fallow after a heavy summer rain and proved it a failure. Instead of conserving mosture it leaves the fallow open to the sun, and the area alongside which was not worked will give a better return. After harvest work should be brought up to date; the best use can then be made of an autumn rain. Local experience is that best results follow autumn workings. Last year was proof that those who failed to take advantage of the rains had very light yields. With well prepared fallow, seeding is straight ahead work. With the use of combines and with dry pickled seed, the work continues day by day through May, and is complete early in June on most farms. Late sowing, after June 10th, has proved too late during past years, and only suits the year when spring is wet. Such years do not come very often. Through the years a plentiful supply of feed for all stock is necessary. This should be grown and not purchased. More oats should be grown for feed purposes and hay, as well as for grain. Oats are helpful to the soil and a great asset to the farmer. It is customary to run the disc drill through the stubble, sowing one bag of oats to 4 acres. This can only be done in dry weather during March and early April. Occasionally mice are a destroying agent, but not often. Self-sown wheat gives early feed. Oats help in the body of feed right through the year, and in spring supply practically all fodder requirements. Super is not necessary for stubble drilling. Some farmers claim it is not profitable to grow oats on stubble land for hay, but with cultivation and when possible sowing after rain, most farmers are able to grow a satisfactory crop and build up reserve stocks of hay and grain. Sheep are the best side line and can be regarded as a necessity to successful farming. In fact, wheat growing and sheep must go together. They are a source of profit, both by sales of lambs and wool, and indirectly by feeding off fallow and cleaning up roughage on the farm. Some farmers' flocks are very irregular on account of dealing. If all points are considered, often the monetary gain does not compensate for the loss of time in attending markets, &c. The flock at times is too great, and then after a clearance weeds get strong on the fallow. In most hands the permanent flock of Merino ewes is a safe proposition. With a good class of ram the flock will improve from year to year. The fat lamb has come into prominence, and returns, though small, have been helpful. The English breeds with Merino cross mature earlier than the Merino, and the lamb is much more attractive after the rail journey to the Abattoirs. This district has done well in recent years in the number and quality of lambs sent to market. Some farmers continue to favor the 'all-Merino' flock, and there are arguments in its favor. Keeping the straight line has advantages in breeding, and gives less worry about fences. The flock is used in front of the plough or on fallow, while with a crossbred flock the interests of the farm are inclined to be neglected, and special attention is given to fattening. However, both flocks are profitable, and by having the two it helps to keep up the supply of Merino ewes in the district.'' Discussing the paper, Mr. H. Fewings said harrowing the fallow had proved beneficial on his farm. Mr. A. Hawthorne also claimed it to be beneficial after a heavy rain. Mr. Young claimed autumn workings were advantageous, but to remove the swings from harvester to cultivator had shown a loss of 3½bush. in the subsequent harvest compared with fallow not touched. Mr. A. Badman favored ''tickling'' the fallow with harrows and keeping the sheep on it. Members were practically unanimous that autumn workings were beneficial, and Mr. W. Davis and A. Bone cited instances of results obtained from same. Mr. Young was asked which he considered the best paying proposition—fat crossbred lamb raising or well-bred Merinos for flock raising. In replying, he said although he was still trying both, he was not convinced which was the better. He considered it was not the monetary gain only to be considered. His opinion was that crossbreds caused considerable trouble by getting into neighboring farms. Mr. W. Davis firmly believed the Merino the

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better proposition for this district. The fat lamb was off the mother for too long a period before being offered at the Abattoirs and consequently lost bloom. Many farmers disced oats into the stubble for feed, and Mr. Young asked if members considered it necessary to apply a dressing of super. Mr. Hawthorne favored no super, and preferred to have a low dense crop in preference to a high and coarse one. Mr. Fewings considered sowing no super meant robbing the ground. Mr. S. Bone said as the soil of the district was deficient in essential minerals it was essential to apply super. Super dressing on pasture played an important part in keeping stock in a healthy condition. Mr. A. Davis considered it was the extra protein that was derived from the succulents which proved beneficial. Mr. E. Gray said super and minerals played an important part in bone formation, and he considered it necessary to sow super. Discussion also centred around the advisability of ploughing in wheaten stubble at fallowing time. Mr. Young said the outstanding crops in the local Competitions, 1931-1932, were grown on fallow so treated. Mr. A. P. Badman said by sheeping the stubble heavily the straw was broken down and caused little or no trouble. (Secretary, H. L. Badman.)

VISIT TO OVERLAND CORNER.

When on their way to the Berri Conference Messrs. W. J. Spafford (Deputy Director of Agriculture) and H. B. Barlow (Chief Dairy Instructor) called at Overland Corner and met several members of the local Branch on the property of Mr. J. L. Loffler.

The Loffler Brothers (Messrs. J. L. and H. A.) have been in the district since 1910, when their father took up the property (uncleared) with the limited capital of a few pounds in cash, a spring dray, and two light horses. After experiencing most of the hardships known to pioneers in the mallee areas, the father died in 1922, and the property was then taken over by his two sons. There are now 8,000 acres on the holding, 6,000 of which are cleared, and a further 350 acres will be rolled this year. The average rainfall is about 8½in., and the highest fall since 1922 was 10.30in. in 1928. Last year 1,600 acres were under wheat and a small area under oats, while 1,400 acres have been sown this year. As the Loffler Brothers are convinced, from actual results, that fallowing is a paying proposition, they expect to work 1,200 acres this year, which area will be more than is customary. As an illustration of the advantages of fallowing, they refer to the experience of 1932, when they cropped an area of stubble land under exactly similar conditions as to time of sowing, seed, super, etc., as their fallow, and the difference in yield amounted to over 9bush. per acre in favor of the fallowed land.

"Gay Lad," the property of Loffler Bros., Overland Corner.

Gluyas is the principal variety sown, but good returns have also been obtained from Sultan, Waratah, and Nabawa. A few years ago they seeded 4 acres of Wimmera Rye Grass and reaped 5 bags of seed. This was resown in strips over 150 acres of a wheat crop, and in the following year it produced good grazing, growing as high as 18in. This grass has the advantage of lasting four to six weeks after barley grass has finished.

The livestock on the property consists of 50 horses, including 13 foals, 800 Merino sheep, and a small herd of dairy cows. The stallion "Gay Lad," rising five years, is well bred, his grandsire being Dunure Footprint and his sire Flashdale. He has been shown in the Clydesdale class at Waikerie and Loxton since he was two years old and has not been beaten. He has a progeny of over 20 foals and two of his colts have been sold. The Loffler Brothers have also been interested in hunters, and possess an array of valuable cups—some of which had to be won three times—showing their successes in these events. The heifers on the property were sired by Hampden Beauty's Repulse from Mr. J. A. J. Pfitzner's stud at Hampden. This bull has recently been disposed of, and in order to continue improving the herd a suitable Jersey bull is being purchased from the Eudunda district.

Hunter, owned by Loffler Bros., Overland Corner.

Miss Loffler, who takes a practical interest in the work of the farm, entertained the visitors at tea, and in the evening Mr. Spafford gave an address to the Bureau on "Line Breeding" and Mr. Barlow on "Feeding Dairy Cattle."

Other Reports Received.

Branch.	Date of Meeting.	Attendance.	Subject.	Secretary.
Coomandook ..	1/5/33	8	Address—R. L. Griffiths .	W. Trestrail
Coomandook ..	26/5/33	—	Discussion	W. Trestrail
Kulkawirra	6/6/33	10	Address—R. L. Griffiths .	H. Elliot
Overland Corner	14/6/33	28	Addresses—W. J. Spafford, H. B. Barlow, H. C. Pritchard	H. Loffler
Moorlands	14/6/33	10	Question Box	R. Wilmshurst
Nunkeri	7/6/33	10	Discussion	E. Peltz
Mypolonga	21/6/33	—	Reorganization of Branch	P. Pickering
Marama	21/6/33	10	Paper from *Journal*	T. Hinkley

SOUTH AND HILLS DISTRICT

BLACKWOOD (Average annual rainfall, 27in. to 29in.).

May 8th.—Attendance, 20.

Mr. C. F. Anderson (Government Poultry Expert) addressed the meeting. The following answers to questions were given by Mr. Anderson:—

Can cabbages cause trouble in a flock of birds if fed too liberally *Answer*—Provided they are not sprayed with materials which are poisonous, they should not do any harm.

Are all heavy breeds likely to be bad for broodiness? *Answer*—In our climate, yes; and if kept, care should be taken to avoid breeding from noted broodies, as the trait might be accentuated. To cure broodies, make them uncomfortable in a small cage, or put with cockerel. The earlier the broodies are removed from the pens, the quicker will they be put off the brood.

Are thistles good greenfeed? *Answer*—No; they are too stringy. Irrigated crops are the best.

Are soursobs harmful? *Answer*—No.

Are apples likely to put fowls off lay? *Answer*—If many were given to fowls unaccustomed to them they would do so.

Can roup be cured? *Answer*—Yes, if taken in time. In a small flock treat each bird by cleaning out the throat and then painting with iodine. Isolate. With a large flock, isolate infected birds and put a little kerosene in drinking water to prevent spread of infection.

Is whole meal a good substitute for pollard? *Answer*—For young pullets in winter it is superior to pollard, but should be fed sparingly to older fowls, owing to its fattening propensities. A good proportion is two parts of whole meal by weight to one part of bran for winter laying pullets. In summer, return gradually to pollard instead of whole meal. Also feed less mash and more grain in summer. Watch moulting hens for fatness.

Is cod liver oil necessary for chickens? *Answer*—Chickens reared in battery brooders should have it, but it is not necessary for chickens which are allowed to run out.

Should big birds be chosen for breeding from? *Answer*—Yes. Big birds lay big eggs. Big eggs hatch strong, healthy chickens.

Are fowls which moult late better than those which moult early? *Answer*—Yes. They usually lay many more eggs and are not long in the moult as the early moulting ones. (Secretary, H. Goldsack.)

FRAYVILLE.

May 6th.—Attendance, 14.

COLLARS AND SORE SHOULDERS.—The Hon. Secretary read the following paper:—"Sore shoulders frequently and unnecessarily interfere with the utility of the team. All sores are caused by friction or pressure. If friction is applied to a portion of skin, the hair is rubbed off and a hole is worn in the skin. The animal off condition shows the effects of friction soonest, especially under the collar or girth. Pressure acts differently; it cuts off the blood supply of the skin, and kills and cuts through the tissues of the body. The animal in condition has hard, rubber-like muscles to relieve the pressure, but the constant weight of ill-fitting or badly-shaped harness will produce a sore. Collars sway on the oblique surfaces formed by the moving shoulder-blades, they are fitted on parallel surfaces when the horse is standing still. In the true draught shoulder this sway is least, the shoulder is upright and has a wide collar bed—muscle on which the collar can rest. All collars rise on the shoulders when weight is put on them, and the finer the shoulder, the more this occurs. Friction is the chief cause of collar trouble, and the secret in fitting a collar is to get it to fit close to reduce friction. Its inner edge must sit close against the side of the neck, but it must not be pressed on to the shoulders, otherwise it is too narrow. Between the inside of the body of the collar and the neck it should be possible to move the flat of the fingers from top to bottom—more than this allows of too much side play, and causes chafing. The collar should rest evenly on the shoulder from top to bottom, and to judge this, grasp both sides of the collar and press into position. There should be no see-saw motion, which indicates that the collar is only bearing on its centre. The crest of the neck must not be pinched—a common fault with many collars—the hand should pass freely between the crest of the neck and the collar. The fit of the collar should admit of the passage of the hand and wrist between it and the neck at the bottom. This allows sufficient rise, more makes a collar wobble. The thick leather that covers the body of the collar, or afterwale, sometimes presses on the skin and causes injury. The hames should take the shape of the collar, for if they are too light or too straight the collar becomes too tight. It is clear that a collar that fits a horse in condition will be too large if the animal 'falls away.' There are horses that no collar will suit, no matter how perfect a fit it may be, and to cure a sore on such horses a breastplate is very satisfactory. I do not use any ointment for sore shoulders, but always cure them with working. The collar should be kept in repair, but too much stuffing causes too much heat, and thus scalds the shoulders in summer." (Secretary, V. Eichler, Mannum.)

LANGHORNE'S CREEK (Average annual rainfall, 14.76in.).

May 10th.—Attendance, 8.

BEE-KEEPING.—Mr. V. Tugwell read the following paper:—"To prepare for bee-keeping, get the hive ready; a standard hive with a floor, 10 frames properly wired, and foundation comb securely fastened so that the bees will work them straight. A mat is placed on top of the frames to keep the bees warm, provide ventilation through the hive above the frames, and to keep the bees out of the lid. The lid should fit evenly, so the bees cannot get out; a hole being bored through each end of the lid and covered with wire gauze for ventilation. The hive should be painted to preserve the wood; soft wood will not last long when continually exposed to the weather. I favor the flat lids, because they are convenient for shifting when stacked one on top of another. The bees usually swarm in spring and through the summer months. When a swarm settles, have the hive complete and place it as near to the swarm as possible, with the mouth or opening nearest to the bees; then take off the lid, remove mat, and straighten up the frames with the same space between each. If the swarm is hanging conveniently, it is an easy matter to shake them on to the frames; if hanging high, the lid is very handy to shake them into before tipping them on to the frames. Then place the lid on, not quite close for a while, to give the bees a chance to go in the hive—get the queen in and the bees will follow. When they have settled down, take off the lid and remove the frames gently—one at a time—and look for the queen; when found, put the mat on, then fit the lid tightly to prevent the bees getting in or out, except through the opening made in the front, and leave them until evening to shift to their permanent stand. Leave them alone for a few days, then light the smoker and look through them to see how the queen is laying her eggs for brood. If they are compact around the centre of the frames—about an inch from the top should be filled with honey and pollen—the queen will do if her breed is satisfactory. If the eggs are scattered and not too plentiful, the best plan is to kill the queen and obtain another. The swarm must be maintained and worked into strong condition so that a super can be added to the hive ready for the honey flow. If the swarm is savage it is advisable to kill the queen and breed a quieter one, to save using the smoker too much, because it is apt to smoke the honey or injure the bees, though the blast from the smoker should not be hot. In going through the hives, a veil is required to protect the face from stings; the veil can be made from various materials—mosquito net is quite satisfactory, but it should be long enough to go over the hat and cover the head and neck. The arms should be bare or covered with some cotton material—not wool. After getting the bees in good working order in a single hive, put on a super, if the the swarm is strong enough, to work a two-storey hive. A super is similar to the bottom box, but has no floor, and the sides are grooved to fit on the bottom box; the lid fits on the super the same as on the hive. When the honey flow commences and a start is made to take the honey, the following will be required:—A smoker, a box in which to carry the frames, some water kept boiling on a fire, two un-

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capping knives, and a receptacle in which to put the uncappings. After being uncapped, the frames are placed in an extractor, which is turned rapidly, the honey is thrown out of the cells to the side of the extractor, where it drains to the honey-gate at the bottom. It should then be strained before it is put into a tank to be 'ripened' a few days; after which it may be used or tinned for sale. Working amongst bees should only be done on warm days; not too early in the mornings nor too late in the evenings. When the days are warm many of the bees will be gathering honey and pollen, consequently there are not so many left at home to handle when opening the hive for any purpose—such as looking for a queen or disease, or swarming preparations. The opening of a hive on cold or wet days may cause some of the brood to be chilled. Foul brood is the worst disease, and all beekeepers should learn to know the symptoms. Another trouble in the hives are the bee moths, which lay their eggs on the combs not covered by the bees, and the grubs which hatch out, eat the combs and make webs through them that the bees cannot clean out, and gradually they become discouraged and leave the hive. There are several different recognised broods of bees which are favored by different apiarists. When the swarming season advances and it is desired to keep the swarms strong, go through the hives about every 10 days and take out all the queen cells—they are quite different from the cells of worker bees or drones. If more colonies are to be formed, the bees can be allowed to swarm naturally, or a double strong hive, having plenty of bees in it can be divided. Note where the queen is, and shift that portion to one side, completing it with a floor and lid. See that other half of the hive has fresh eggs in some of the frames—if there is not a spare queen to give them—and leave it in the place from where the queen was taken. There are several different ways of transferring queens into hives—by using a queen cage, or by using nicotine out of a pipe stem by placing some on the back and tail of the queen. This latter method is risky. It is advisable at all times to use full sheets of foundation comb, because they are impressed with worker cells. If strips only are used the bees work many of the drone cells when they draw the comb down, and as any frame in a standard hive may be moved from one hive to another, one is apt to get a lot of useless drones instead of working bees when these frames come to be used as brood frames. The swarm with the old queen leaves the hive to find a new home, and when it settles, foundation comb should be given as soon as possible, for on leaving the old hive all bees take a supply of honey with them to last for several days, or if they have somewhere to go they are ready to start work and draw out comb for breed and honey. It takes about three weeks for the brood to hatch for worker bees, and about 14 days for queens. The life of a bee is not very long, so that it is necessary for them to commence work as soon as possible to keep up the strength of the warm.'' (Secretary, P. Nurse.)

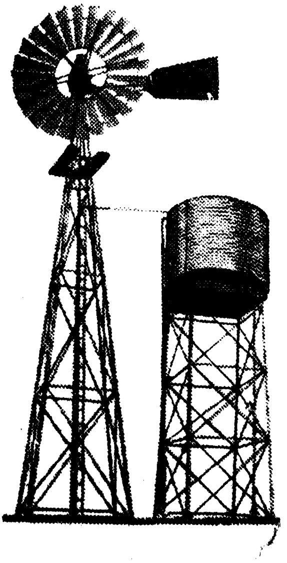
MILANG (*Average annual rainfall*, 14.92in.).
May 5th.—Attendance, 18.

Management of the Dairy Herd.—Mr. A. Kelly presented the following paper:—''The bull, which is often regarded as 'half the herd,' demands first consideration. He should always be kept in a yard, or tied up, preferably in a yard where he has more chance for exercise, which is absolutely necessary. He should be given the same feed as the cows—chaff with a change of sometimes bran, crushed oats, or a little linseed meal. Also provide a salt lick and give an occasional sheaf of hay. This change is relished by the bull, and I have not had any trouble in keeping the bull fit and getting the cows in calf. I advocate a bull from high producing stock from whatever breed the dairyman desires. *Cows.*—There is only one sound method to carry out dairying successfully, that is the testing of all cows, this is the first matter of importance, for from this fact the dairyman can gather some idea of how to feed the cows economically, which information is absolutely necessary; for instance, one cannot afford to give a cow producing between 100-200lbs. butterfat a year the same ration as a cow giving between 400-500lbs. fat, hence the reason for testing. Once testing is started each cow can, and should be fed according to her production. With personal supervision I have found that cows require a change of food to maintain high production, therefore I make a practice of always feeding chaff—with hay feeding there is too much waste. For a change of food they have at different times crushed oats, bran, or linseed meal with a good supply of bone meal, a little salt in the food is helpful. To produce maximum yields a cow should be mated to calve about every 12 months, and it is necessary to give her a spell of not less than six weeks—preferably eight weeks. After testing, a very important item is to dispose of the culls, or low producers. Do not sell them just as they are dry, but if sound, carry them on, put a little condition on them and sell them with calf at foot. To replace these cows, breed from high producers and avoid going to the sale ring as much as possible. Whilst some good, clean cows can sometimes be obtained in this way, there is always the chance of introducing disease, which can soon do a great deal of damage in a herd. If cows are urgently wanted, go to some one who is reliable and will recommend a cow, even if it costs a little more. *The Calf.*—Calf feeding is one of the most important factors, so far as the heifers are concerned. The best method is for the first week give fresh milk, then about half for six weeks, but do not over feed. The latter tends to scour. Owing to the low price of butterfat at the present time, this feeding is preferable to buying other foods. Calves should be kept on milk until about six months old, but should have chaff and long hay as soon as they will eat, this has a tendency to keep a calf from scouring. Regularity is one of the main factors in dairying, especially milking and feeding. To give some idea of how the yield per cow can be improved by testing, culling, and feeding, the following figures of my herd are quoted:—In four years I have brought the lowest cow in the herd from 130lbs. to 324lbs. butterfat, average 241lbs., while the highest cow has risen from 352lbs. to 497lbs. butterfat, average 357lbs. By this method I have learnt that if a cow is not worth feeding, she is not worth keeping.'' (Secretary, L. Yelland.)

MOUNT PLEASANT (Average annual rainfall, 27.18in.).

May 12th.—Attendance, 6.

Caponizing.—The following paper was read by Mr. F. Ayers:—*To Prepare the Birds.*—From 24 to 30 hours before performing the operation the cockerels—the birds for preference being from two to four months old—should be confined in a clean and airy coop or room. The best time to confine them is at early morning, as their long fast will then end about noon on the following day, at which time the operation is best performed. Should the day turn out wet and dull, postpone the operation until the day is bright and fair. It is necessary and important to have as much light as possible. If it be a dull day, and it is decided to caponize, the birds may be given little water and food if necessary, but it is much better to avoid this if possible, it is very desirable to have their intestines quite empty, thus allowing the testicles be more readily seen, besides giving the operator much more room in which to rform his work. Lay the bird on the operating table—the top of a barrel or end a fair-sized case—and wrap a cord around the bird's legs above the knees. Wrap other cord around the wings close to the body, have wire hooks on the ends of the rds, attach half bricks to ends of cords, and allow them to hang on either side of e table, to hold the bird securely on its side. Have all instruments ready; clean, disinfected, and sharp. After slightly wetting the spot—high up in the flank, between the top portions of the two rear ribs—pluck out a few feathers to give better vision. Turn down the feathers from the upper part of the last two ribs, and just in front



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of the thigh joint, pull the flesh on the side down towards the hip. When t operation is finished, the cut between the ribs will be entirely closed by the skin goi back to its place. While holding the flesh back with the left hand, with your rig hand take the knife—a piece of hacksaw blade makes one of the best—and ins it—the cutting edge being away from the operator—between the last two ribs cutting down, and then up a little, following the direction of the ribs. Make the cut as sma as possible, from 1in. to 1½ins. is about the right length. Cut through the skin and ribs, but not deep enough to injure the intestines. There is not much danger of doing this if they are empty, as they will be if the birds have had a long fast. If the cut bleeds, wait a moment, allow the blood to clot on the thin skin covering the bowels, then remove it with a pair of forceps (a pair can be made from light hoop-iron that will answer the purpose). Take a spreader, which can be made from a piece of stout case wire, and place it between the ribs. Now if necessary make the incision longer, but do not cut too near the backbone. Upon looking into the cut a thin tissue-like skin will be seen just under the ribs, enclosing the bowels. Take a hook-ended wire and peck the tissue open to make way for the removal of the testicles. One of the testicle will now be seen lying close up to the back of the fowl; sometimes both testicles are in view, but not often. The testicle brought to view is enveloped in a film which should be brought away with the testicle. Now follows the only dangerous part of the operation—getting hold of and removing the testicles—and with a steady hand and good light there should be little trouble. Attached to the testicle and lying back of it is one of the principle arteries of the fowl. If this is ruptured in the removal of the testicle the bird will bleed to death. Have a 'canula,' thread it with a strong horsehair or very fine steel wire, and form a loop at the end. The hair or wire being very fine, is easily slipped between the testicle and the artery without injury to either. Take the canula in the right hand, and adjust the loop to the necessary size to slip over the testicle. Have the ends of the wire or hair project well over the top of the canula to enable the operator to obtain a good hold. Insert the canula into the bird, and carefully slip the loop over both ends of the testicle. This may at first take some time. Hold the end of the canula close down to the testicle. Both testicles may be removed from the same opening, but to do so first remove the lower one; if not, the small amount of blood that follows will cover the lower one. When the testicle is entirely surrounded by the loop, take both ends of wire or hair at the top end of the canula, hold it tight with finger and thumb, and draw on it carefully and firmly. Be careful to have the loop around the testicle and keep the end of the canula close to the testicle all the time. If drawing on the wire or hair does not at once cut the testicle clear, twist the canula around gently until the testicle is separated from its attachments, taking care to see that no part of the testicle is left behind. Remove any dirt or feathers if necessary. Remove the spreader and cords, release the bird, and the skin will slip back, usually covering the wound. Never sew it up. The advantages of caponizing are:—No trouble separating cockerels from hens, no fighting, birds grow fully 25 per cent. larger, fatten easily, are tender and far superior in flesh, are quiet and always contented. The comb and wattles do not develop and are not a bright scarlet or red. Instruments can easily be improvised if one is handy. Good light and patience are absolutely necessary.'' (Secretary, D. Smith.)

Other Reports Received.

	Date of Meeting.	Attendance.	Subject.	Secretary.
Inman Valley ..	5/33	24	Address—W. J. Spafford.	H. Lewis
Mount Compass	33	45	Address—A. Peters, W. Hunt, and M. Jacobs	C. Verco
Mount Compass	1/6/		Address—Fords	C. Verco
Cherry Gardens.	3/6/33	27	Annual Meeting	H. Stone
Hope Forest ...	6/6/33	17	Address—R. Baker	E. Muldoon
Blackheath	8/6/33	26	Paper from *Journal*	E. Paech
Langhorne's Ck.	8/6/33	1	Address—W. J. Spafford.	P. Nurse
Lenswood and Forest Range	29/6/33	8	Election of Officers	B. Lawrence
Macclesfield ...	15/6/33	14	Annual Meeting	H. Ross
Milang	7/6/33	10	Cinema Lecture—"Cement"	L. Yelland
Frayville	8/6/33	19	"Seeding," S. Gretag	V. Eichler
Blackwood	12/6/33	11	Address—R. Hill........	H. Goldsack
Mt. Pleasant ...	9/6/33	6	"Bacon Curing," P. Haeusler	D. Smith

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